TECHNOLOGY DEPT.

Devoted to
TEXTILE
CHEMISTRY
BLEACHING
DYEING
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FINISHING

MARCH 16, 1942
VOLUME 31, No. 6

AMERICAN DYESTUFF REPORTER

OFFICIAL PUBLICATION
of the
PROCEEDINGS
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OF TEXTILE CHEMISTS
AND COLORISTS

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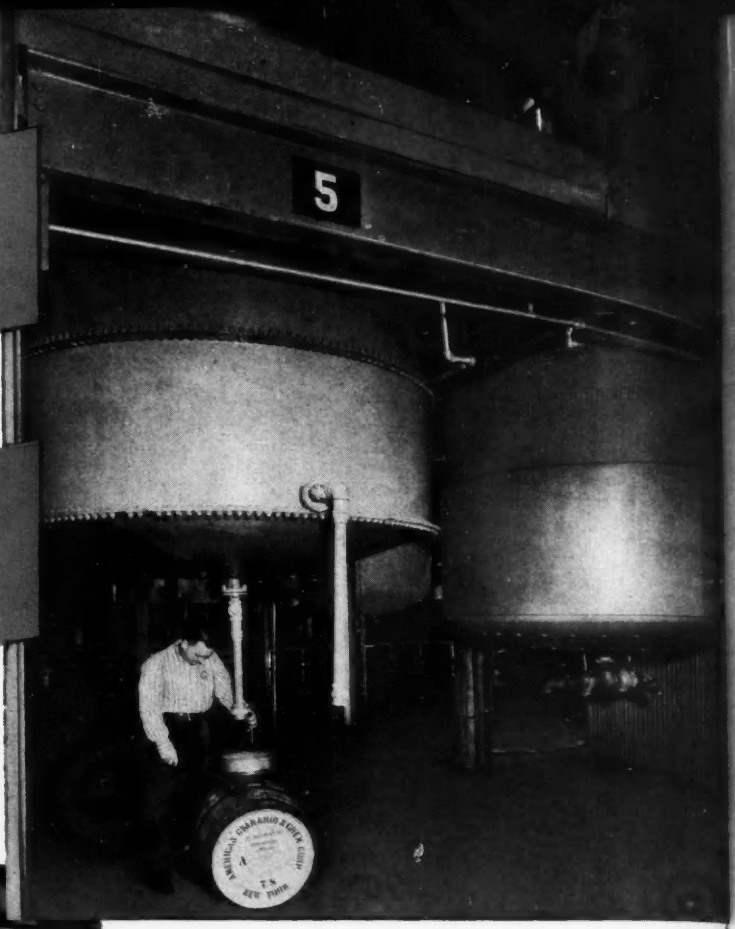

(above) One of Cyanamid's modern large-capacity units for the production of textile chemicals. Large-scale production means greatest possible uniformity in chemical supply.

(left) A similar unit in another Cyanamid plant. Each step in Cyanamid's volume production methods is planned and carried out to deliver highest quality as well.

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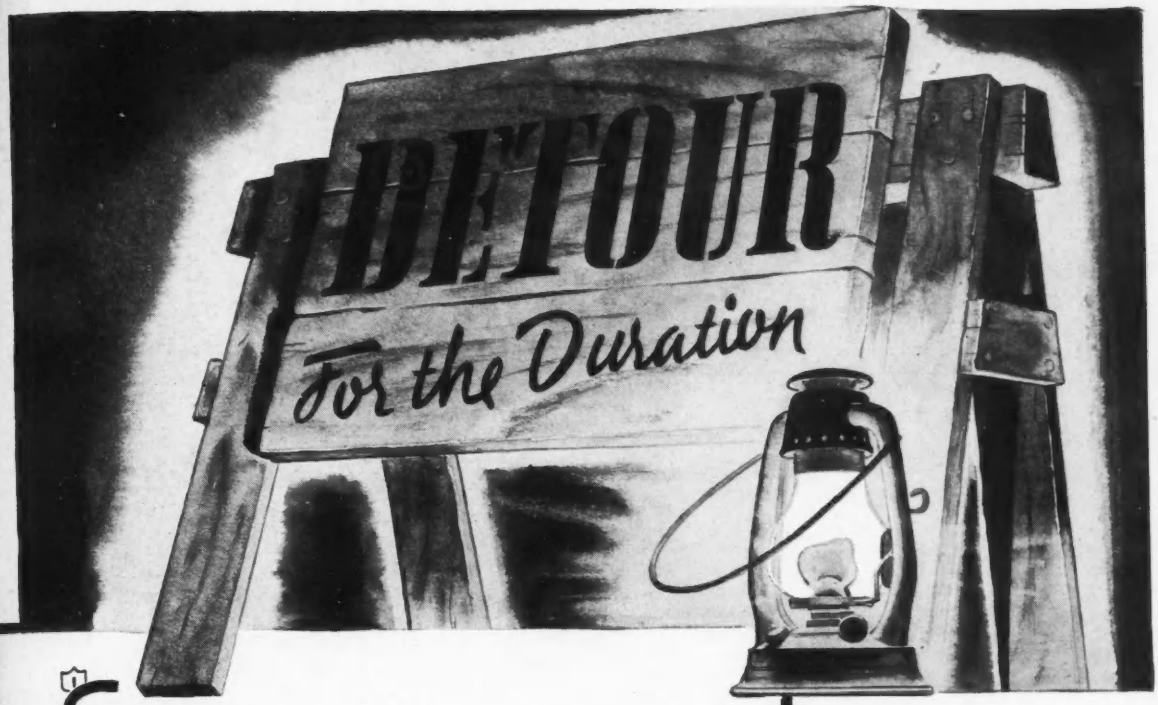

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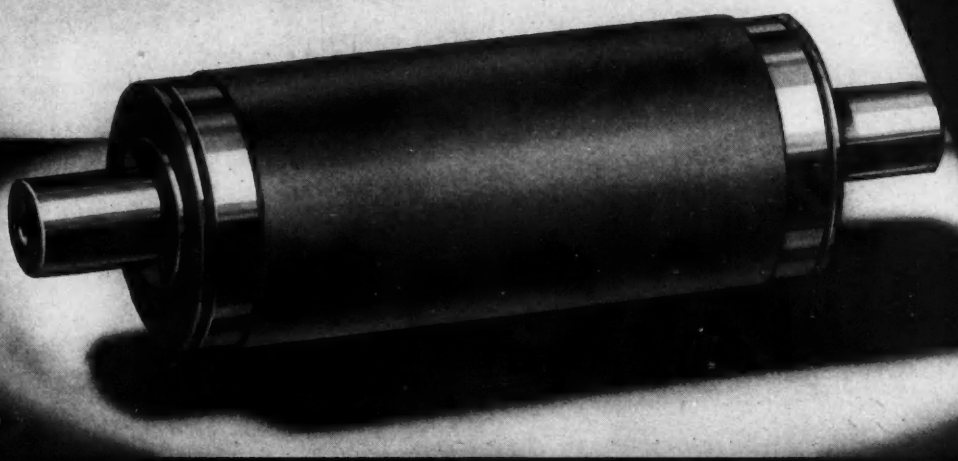

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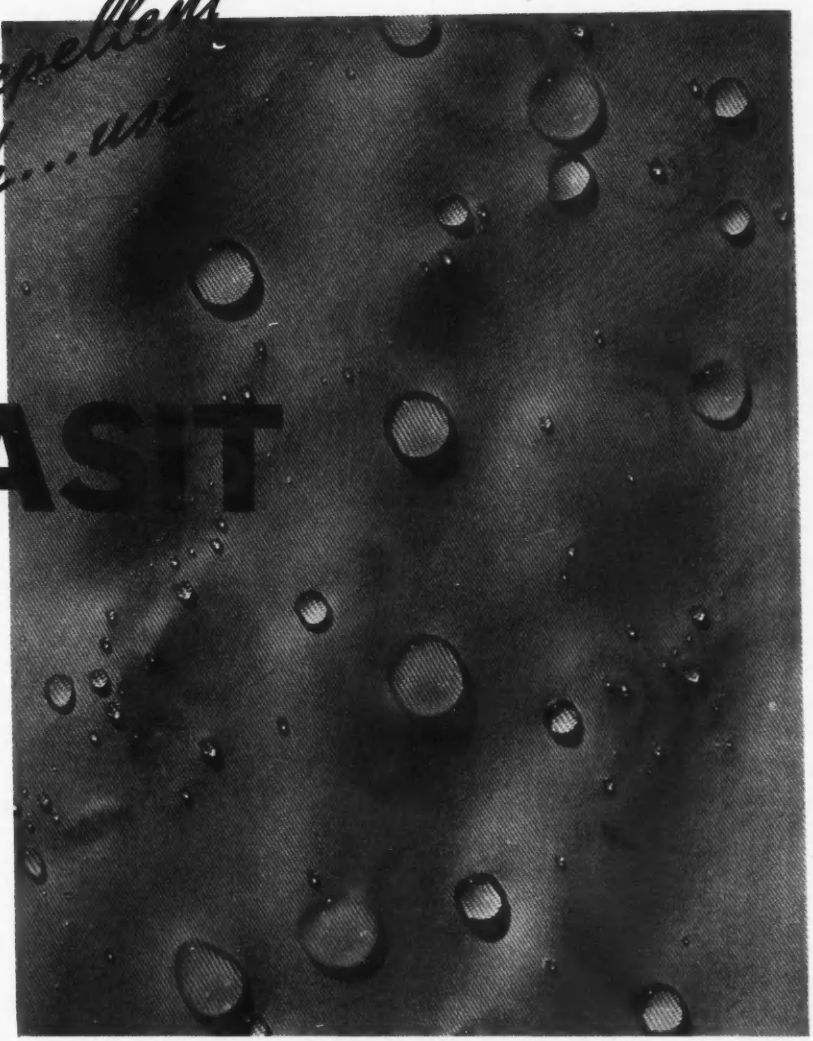

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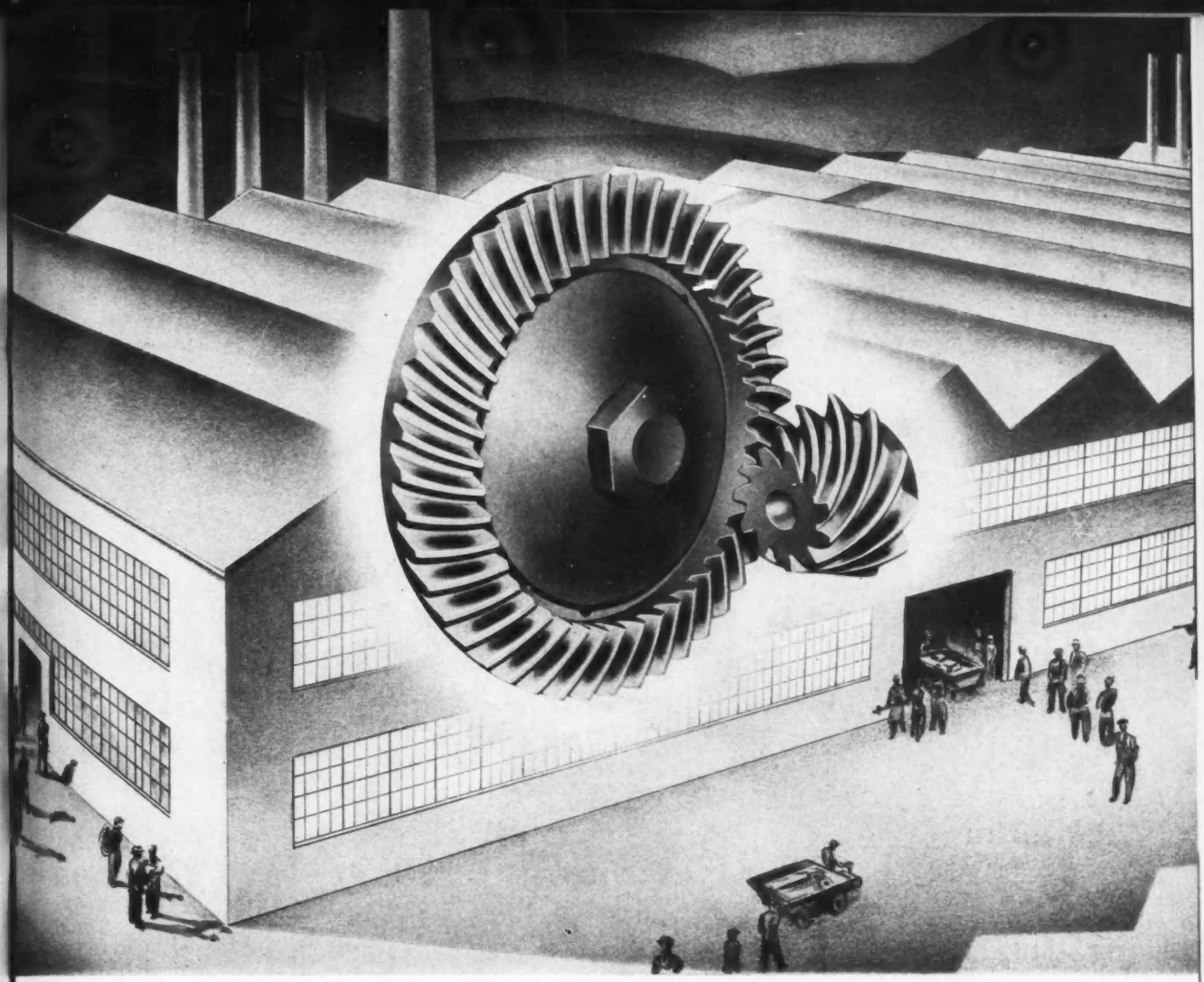

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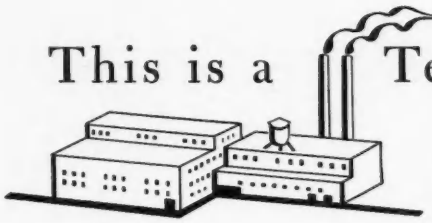
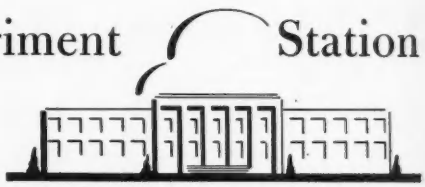


Its job is to produce the material to clothe our soldiers, sailors, and marines.

This is the Hercules Experiment Station



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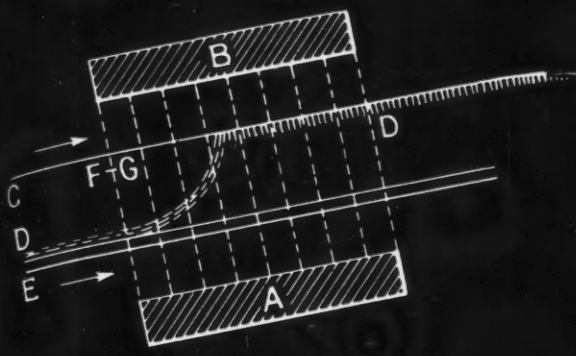

KEY TO DIAGRAM

The backing fabric, *C*, coated on the face with a suitable adhesive, passes between the negative electrode, *A*, and the positive electrode, *B*. The cut fibers, *D*, are carried on the conveyor belt, *E*. Entering the electrostatic field between the two electrodes, the cut fibers first rise and stand on end with their long axes parallel to the lines of electrical force *F-G*, and then are propelled at high speed toward the positive electrode.

Will Pile Fabrics be Made *ELECTROSTATICALLY?*

Will the flying shuttle be replaced by flying fibers electrostatically deposited on the fabric and imbedded, end on end, 300,000 to a square inch?

None can foretell what invention will do to age-old weaving techniques or how chemical research will change synthetic fibers. But one thing you can be sure —before you are asked to dye these strange new fabrics, National Technical Service will be ready with the formulas that give you the required fastness standards.

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(Electrostatic Deposition processes are covered by U. S. Patents and Patents Pending.)

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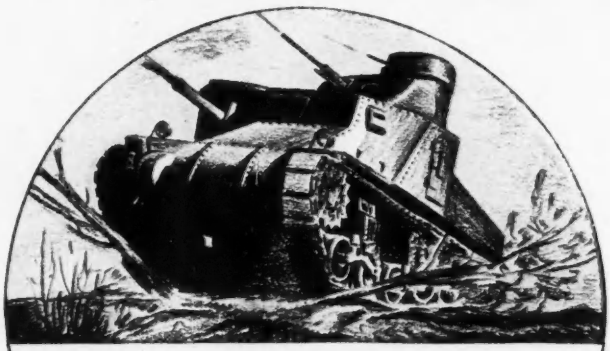
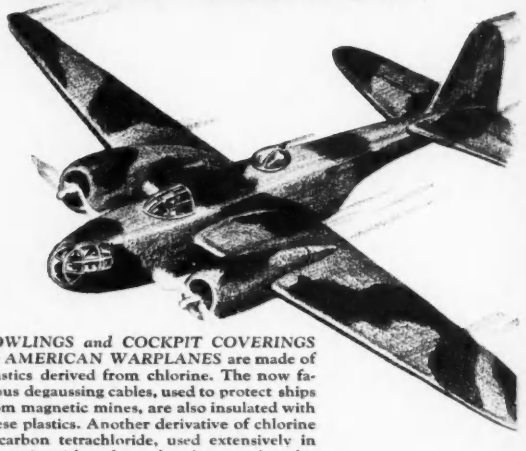
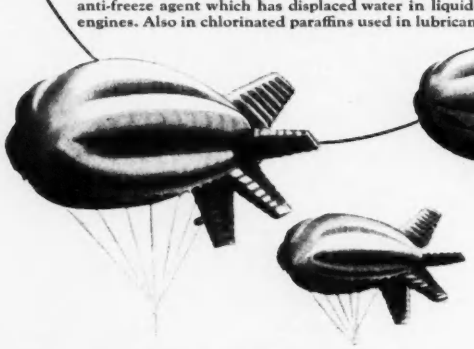


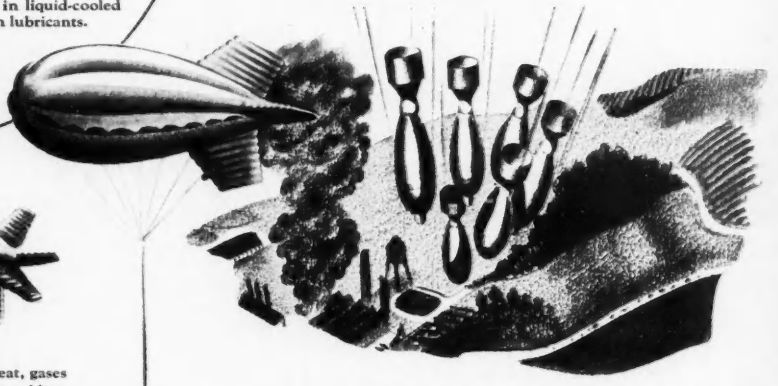
HI-OCTANE GASOLINE for U. S. TANKS and PLANES is produced from ordinary gasoline and tetraethyl lead. Rapid precision-fitting of tank and plane parts demands trichlorethylene, a degreasing solvent. Both tetraethyl lead and trichlorethylene require large quantities of chlorine. Chlorine is also used in the manufacture of diethylene glycol, the anti-freeze agent which has displaced water in liquid-cooled engines. Also in chlorinated paraffins used in lubricants.



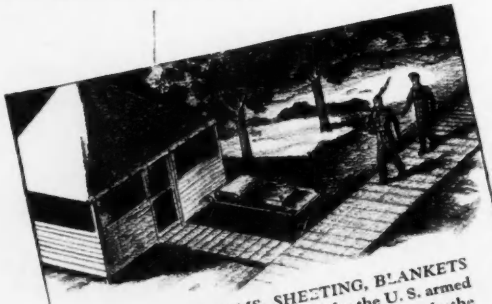
COWLINGS and COCKPIT COVERINGS for AMERICAN WARPLANES are made of plastics derived from chlorine. The now famous degaussing cables, used to protect ships from magnetic mines, are also insulated with these plastics. Another derivative of chlorine is carbon tetrachloride, used extensively in fire extinguishers for tanks, planes and trucks.



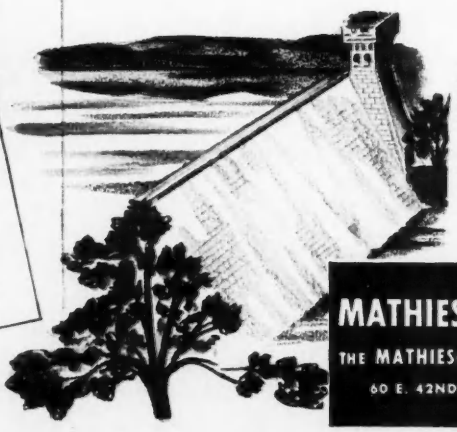
BARRAGE BALLOONS, capable of withstanding heat, gases and sunlight, are being manufactured from synthetic rubber. America's fast-growing production of synthetic rubber for protective balloons and other wartime needs has put an extra load upon the chlorine industry.



ALL-OUT PRODUCTION of MUNITIONS requires large amounts of chlorine, especially for processing of cotton linters for smokeless powder and other explosives.



TENTS, UNIFORMS, SHEETING, BLANKETS and PARACHUTE FABRICS for the U. S. armed forces are being turned out in millions of units by the textile industry. Thousands of tons of liquid chlorine go into the processing of these vital war materials.



U. S. BASES and ARMY CAMPS require large quantities of chlorine for water purification and sewage treatment. This widespread use of chlorine is in addition to large-scale requirements of state and municipal water works systems.

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MARCH 16, 1942

VOLUME 31 NUMBER 6

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DYESTUFF REPORTER

VOLUME 31 MARCH 16, 1942 NUMBER 6

Eleventh Annual Meeting

INTER-SOCIETY COLOR COUNCIL

THE eleventh annual meeting of the Inter-Society Color Council was held at the Metropolitan Museum of Art in New York City on February 26th and 27th. The program of the meeting, together with abstracts of papers presented, follows:

* * *

Thursday, February 26, 1942

10:00 A.M.—BUSINESS SESSION: Chairman: Deane B. Judd

Reports of Officers:
- Chairman, Deane B. Judd
- Secretary, Dorothy Nickerson
- Treasurer, Norman Macbeth

Reports of Committees:
- Executive Committee
- Finance Committee, Norman Macbeth, Ch.
- News Letter Committee, I. H. Godlove, Ch.
- Public Relations Committee, M. Rea Paul, Ch.
- Problems Committee (and Subcommittees), Forrest Lee Dimmick, Ch.

Reports from chairmen of delegations:
- The American Artists Professional League, Harold C. Parks, Ch.
- American Ass'n of Textile Chemists and Colorists, Walter M. Scott, Ch.
- American Ceramic Society, Woldemar Weyl, Ch.
- American Psychological Association, Forrest Lee Dimmick, Ch.
- American Society for Testing Materials, M. Rea Paul, Ch.
- Federation of Paint & Varnish Production Clubs, John C. Moore, Ch.
- Illuminating Engineering Society, H. P. Gage, Ch.
- National Formulary, American Pharmaceutical Ass'n, Katherine Graham, Ch.
- Optical Society of America, R. C. Gibbs, Ch.
- Society of Motion Picture Engineers, Ralph M. Evans, Ch.
- Technical Ass'n of the Pulp & Paper Industry, John L. Parsons, Ch.
- The Textile Color Card Association of the United States, Inc., Margaret Hayden Rorke, Ch.
- U. S. Pharmacopoeial Convention, Frank J. Pokorny, Ch.
- Individual Member Group, Le Grand H. Hardy, Ch.

New Business

* * *

2:00 P.M.—TECHNICAL SESSION: Color in Art Education: Co-Chairmen: Royal B. Farnum—Art Education, and Carl E. Foss—Technical

1. Emotions Versus Measurement in Teaching Color

NORMAN C. MEIER, *Dept. of Psychology, University of Iowa*

Experimental studies by psychologists on color preferences[1], on the apparent "weight" of colors[2], on size and weight[3], and on attention value[4] have not been of great value to art education. Some have yielded negative findings, other inconclusive results; most of such studies must be limited in their findings to the small population sample of the laboratory. The work in binary combinations of colors and on brightness combinations[5] go little farther than to suggest that the preferences refer back merely to the preferences for the individual components. The studies of appropriateness of single colors and color pairs for specific uses suggests interest for art education and yields some measurement, though indecisive, on the associations found between colors and various purposes involved in their use[6]. The lack of great certainty in the associations, suggests, in lieu of more convincing evidence, that associations of color with human experience lack sufficient universality to be dependable except in the instances usually advanced in psychologies of art and other treatises[7]. The few constancies reduce merely to such experiences as the universality of viewing blue in the sky and on reflecting surfaces as bodies of water; blue green in the vegetation of habitable areas; and the less frequently spot and transient experience with red and yellow[8]. The emotion-producing properties of field color are as yet not fully determined scientifically; yet universality and consistencies in response to the four psychological primaries, following the Hering theory, constitute a logical basis for permissable associations of interest and value to art education. Beyond this limited conception of emotion-inducing properties, it is not safe to venture, since one soon finds himself in the realm of subjective presumption.

Two procedures were described which are of possible value to the teaching of color. The first is an adaptation of an experimental procedure once used in the Psychological Laboratory of the University of Toronto[9], combined with sampling methods and the paired comparisons psychometric method[10]. It is essentially a procedure for deriving a group consensus of pleasing binary color combinations of variable magnitudes. Most studies employing patches of colored paper, each of equal size, introduce inaccuracies attributable to difficulties in control of material and lighting; furthermore, the presentation of equal areas, while desirable from an experimental viewpoint, does not closely relate itself to the actual use of color in art or industry: e.g., small amounts of color used as trim or accents, in relation to larger areas.

The procedure would employ spectral color, originating from gratings, and projected from positions at each size of subject with mirror deflection so that it is possible to introduce first onto the field a ground color and then, as a variable, a color first seen as a mere point. By means of synchronized aperture-control, the point of transmitted color may be made to displace more and more of the ground color at the will of the subject, until the point of maximum pleasantness is reached. Another color is then introduced as transmitted color. The procedure continues until all the colors involved have been seen in variable relation to every other color, following the paired comparisons formula.

Since the judgment of a single subject represents merely that person's preferences at the single occasion of making the judgment, it has validity and interest only in the improbable instance that this individual should represent the median taste of the general population, or in the likewise improbable circumstance that it represents the median of the artistically competent. It but need be taken into account, however, that if art education should deem it expedient and desirable to know what color combinations are most generally pleasing for the general population or to the artistically competent universe, either or both can be determined approximately by combining the procedure with sampling methods[11]. There would be required, additionally, simply the identification of a reasonably adequate representative sample of the statistical universe to be explored. Since it might be of greater interest to confine our attention to the artistically competent group, that procedure was outlined in the paper, with reference to other problems as well.

The second adjunct to the teaching and study of color under control, concerns the use in the art school laboratory of an apparatus constructed in the Art-Psychology Laboratory in the University of Iowa[12]. This apparatus is adaptable to a variety of purposes: the study of object color, of color mixtures, of absorption, of reflection, of accent, of mood, and of creative imagination in the organization of the whole composition. The apparatus is essentially a device for applying fixed and variable color through controlled illumination to objects and for effecting fusion of the setting with supplementary backgrounds projected on a translucent screen from the rear. By means of five sensitive auto-transformers controlling batteries of the primary colors, n-variations of these colors may be produced, together with n-variations of them in combination. Absorption, diffusion, and reinforcement are made possible by spot and flood accessory sources. The apparatus and its operation were described and products of its use illustrated on Dufay color slides.

[1]Bradford, 1913.
[2]DeCamp, 1917; Monroe, 1925; Koch, 1928.
[3]Warren and Flynn, 1926.
[4]Luckiesh, 1923; Nixon, 1924; Morris, 1929.
[5]Geissler, 1917; Metcalf, 1927; Koch, 1928.
[6]Collins, 1924.
[7]Graves, M., The Art of Color and Design. New York: McGraw-Hill, 1941.
[8]Meier, N. C., Art in Human Affairs. New York: McGraw-Hill 1942.
[9]Baker, E., "Spectrally Pure Colors in Binary Combinations." Univ. of Toronto Studies, Psych. Ser., 2, 1902-1907.
[10]Guilford, J. P., Psychometric Methods. New York: McGraw-Hill, 1936.
[11]Bernoulli. In Rietz, H. L. (ed.), Handbook of Mathematical Statistics. Boston: Houghton Mifflin, 1924.
[12]Meier, N. C., and McCloy, W. A., "An Instrument for the Study of Creative Artistic Intelligence." Psychol. Monogr., 48, 1938.

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2. Color Mixture Systems

DONALD R. DOHNER, *The Art School, Pratt Institute, and* CARL E. FOSS, *Color Consultant*

Color has been used in many ways since the earliest days of history, but it was not until the Renaissance that definite progress was made in the study of color phenomena.

Philosophers and physicists who experimented with dispersion of light into its spectrum soon presented new facts about color mixture, but eager persons were quick to extend these facts beyond their limits. A host of new color theories and color systems grew up through the years based on assumptions that soon became obscure. While real progress was being made, quite often facts were hidden by the fancy of many writers.

Now that considerable is known about color, and international agreement has been reached about the specification of color, the time has come when the mass of information should be boiled down to its essential points and presented anew.

Actually there is only one kind of color mixture. It is the combination of different kinds of light. The mixture of spectrum lights in an appropriate device, the combination of colored beams on a screen produced by the use of color filters on projectors; the results of mixing colors in large and small patterns in designs; a mixture of rotating Maxwell disks can all be described in the same fundamental way.

Any mixtures of materials such as pigments, dyes, inks, are merely ways to produce the required color. All of these mixtures or color gamuts are unique and are controlled by factors that have no relation to color mixture. The proper designation for the mixture of materials is *colorant mixture* and a method of recording these data was presented.

The so-called additive and subtractive systems were shown to be variations of the same fundamentals, and the several trichromatic processes used in color photography, printing, and painting were demonstrated.

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3. Systems of Color Organization.

MILTON E. BOND, *Rochester Athenaeum and Mechanics Institute, and* DOROTHY NICKERSON, *U. S. Department of Agriculture*

It was not until the last century that man began to conceive the subjective aspect of color—color as the thing perceived, rather than as the pigments on the palette, the lights on a screen, or the dyes in a pot. He found that intimate patterns of intermingled colors might give a completely different color sensation to the observer than mixtures of pigments of those same colors. He began to ask, is it more important to arrange my colors according to the result of pigment mixture, or according to the results of optical mixture, that is, the mixture that takes place in the eye? It is clear now that each type of system has its place, for a dyer must know how his dyes will mix, a painter must know how his pigments mix, a stage designer must know how his spotlight colors will mix, a fabric designer must be able to foresee results of mixing colors in large and small pattern designs. Each must know how to handle his own medium. But each should also know how the colors will look to his public when his creative job is completed.

In a sense the artist in color has the same problem as the musician: each must learn to master the rules of his own medium, but all must learn that rules of harmony relate to a common scale and a common method of notation.

There are two systems of color that have been based on the visual aspects of color organization more than any others. These are the Munsell and Ostwald systems, that of A. H. Munsell having been developed in the United States of America at the turn of the century, that of Wilhelm Ostwald in Germany during the years of the first World War. Each has had a growing appeal; each has had considerable investigation from scientists as well as from artists; each has stood the test of attempts at "debunking"; neither is thoroughly understood by many of its closest adherents and advocates. Each places color in an orderly graphic relation; each considers color as an optical phenomena quite apart from considerations of the particular pigments, surfaces, or materials that an artist may use to produce the color an observer sees.

Briefly, the Ostwald system may be described in terms of a double cone within which are 24 monochromatic triangles, each triangle having a Full Color at the central plane where the cones join. The common center is represented by a gray scale, white (a) at the top to black (p) at the bottom. Ostwald considers that every color is a unit in itself, and each unit is made up of some proportion of Full Color, of Black, and White. The neutrals contain proportions of Black and White only. His notation for color consists of its hue number, its notation for black content, and for white content. Ostwald wrote a great many books on color, and in one of them, Die Harmonie der Farben, gave many rules for using his system to produce varied color harmonies. Many teachers have found his suggestions instructive and useful. Only one of his books has been published in English.

The Munsell system can be described also in terms of a solid, but since the Munsell system is based on the idea of scales of hue, value, and chroma, each with visual steps of color that are equidistant, the resulting solid does not have a regular surface. The solid of the Munsell system has a central gray pole, black (0) at the bottom to white (10) at the top. The five principal hues, and their intermediates, extend radially from this central pole. Chroma extends from the neutral center out as far as it is needed for each hue and value. On the charts the chromas extend as far as permanent pigments will allow their representation, but there is a place in the system and notation for all colors whether they have yet been made or seen by man. This, and the fact that the colors are kept to a standard, makes the Munsell system very useful for measurement and specification of color. Few rules were indicated by Munsell for harmony. He did not publish much about his system, and what he wrote was not too clear, but he did leave a color diary from which we are able to glean much regarding the development of his system.

The full paper explained in considerable detail each of these systems, how each was developed, and gave references to the most important publications that concern each of them. It referred to the considerable number of scientific investigations that have been made regarding each of these systems in the years since they were first developed.

Colour Science, by Wilhelm Ostwald, translation by J. Scott Taylor, 2 Vols. (I, 1931; II, 1933), Winsor & Newton, London.
Recent: Nature, May 31, 1941; June 21, 1941.
A Color Notation, by A. H. Munsell, Munsell Color Company, Baltimore, 8th Ed., 1936.
Recent: Journal of the Optical Society of America, Dec. 1940; A series of five papers on the Munsell Color System.

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4. What Color Facts Shall Be Taught to Art Students?

ROYAL B. FARNUM, *Rhode Island School of Design*

Answers to a questionnaire devised by Dr. Farnum and his associates and sent by the Inter-Society Color Council to art teachers several weeks ago provided the basis for this discussion. What shall be the initial approach to color study; creative, scientific, psychological, historical, or other? In what order should these be presented? Should students study color theories, and if so, Ross, Chevreul, Munsell, Helmholtz, Hering, Ostwald or other? Should final productive student-work in color be based on one of the so-called theories, if so, which one or ones? In connection with the approaches now used: is a specific topic or type of study used; what means is provided for practice and research, what is the relative time devoted to this type of study in each year of school or college? Should the same approach and methods be used in teaching color in the Fine Arts and for students in other Art courses? If not, what other approach and methods should be used?

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5. What Technical Information and Materials Are Desirable for Color Study?

ROYAL B. FARNUM, *Rhode Island School of Design, in collaboration with Inter-Society Color Council members*

As a result of the questionnaire on which the previous paper was based, information has been assembled regarding the kind of technical information and materials that teachers desire for use in color study. Some of this material is already available, and in daily use by technical workers. In collaboration with several Council members, answers to questions raised regarding source materials and information were provided.

* * *

8:00 P.M.—POPULAR SESSION: Chairman: Harold C. Parks

6. Lighting the World's Masterpieces

H. L. LOGAN

Manner of display unquestionably contributes to the successful presentation of art objects to large groups of people. Mr. Logan discussed the method used in specifying the special luminous environment used in displaying the exhibit of masterpieces of Renaissance art loaned by the Italian government and recently displayed in American art centers. Professor Clarence Kennedy of Smith College, retained as consultant, worked with Mr. Logan and his associates to find that particular play of light and shadow that would "summon their immortal excellence into visible existence." It is of this display of masterpieces that it was said ". . . it is doubtful if anyone ever saw them even in Italy to greater advantage."

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7. Luminous Effects in Painting

FABER BIRREN

For several years Faber Birren has devoted himself to a study of visual and psychological phenomena in an effort to find new sources of color expression. Numerous experiments have been made to intrepret and apply scientific findings to pictorial ends. His results have been rather striking and unusual and show great possibilities for further development in the arts.

These new principles were discussed and many of them illustrated in actual drawings. Mr. Birren illustrated how many of the conventional mediums of the artist may be employed to achieve singular effects, how ordinary paints are made to appear luminous, iridescent, lustrous. He talked about color-constancy, film colors,

volume colors, pronouncedness—strange words perhaps to the average layman or artist, but terms which are likely to become part of the terminology of the future.

In addition to a rather complete exhibit of drawings the talk was illustrated with numerous models and materials to give these ideas popular interest and appeal.

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8. Abstract Design, Color, and Music

MARY ELLEN BUTE

Mary Bute has designed and produced a number of motion picture films in color demonstrating the relation of abstract design and music. She has developed a method for scoring these color effects in a manner similar to musical scores. Color film was shown, and included the following:

"Escape." Mary Bute designer, Ted Nemuth photographer, after music by Bach,

"Spook Sport." Mary Bute after music by Saint-Saens.

"Tarantella." (Premiere) Mary Bute with collaboration of Edwin Gerschifski.

An experimental film using entirely new technique was also shown.

* * *

Friday, February 27, 1942

10:00 A.M.—SCHOOL EXHIBITS SESSION: Chairman: James R. Patterson

Throughout the session there were on exhibit examples from several schools to show how each color course is planned, and what the results are. The schools that exhibited were:

Cooper Union Art School
The Art School, Pratt Institute
Colorado State College of Education
Rhode Island School of Design

A representative from each school explained, with the aid of color slides, how the course of his school is planned and executed.

* * *

2:00 P.M.—DISCUSSION SESSION: Co-Chairmen: James C. Boudreau—Art Education, and Deane B. Judd —Technical

At this session there were both prepared and open discussions of color problems that art teachers and technical people wished to discuss with each other. This meeting was planned essentially for the art educator's problems and provided a unique opportunity for educators and technical color people to exchange information and points of view. There was also a discussion of Council color problems under the direction of Dr. Forrest Lee Dimmick, chairman of the Council's Problems Committee.

EXHIBITS: MUNSELL AND OSTWALD EXHIBIT: In addition to the school "color course" exhibits, there were on display during the meeting historical models and charts of the Munsell and Ostwald systems. Much of the early Ostwald material is difficult to find in this country, but through the courtesy of the Munsell Color Company it was possible to have on display early Ostwald instruments, an Ostwald solid made in yarns, also paints and color chips as made by Ostwald in the early 1920's. There were a sphere and color tree of the Munsell system, of representative charts, instruments, etc.

Other color charts of historical interest were displayed.

LUMINOUS EFFECTS IN PAINT: Faber Birren prepared an exhibit of the luminous effects one may get by the use of paints. He explained, on the Thursday evening program, the color principles involved in producing these effects.

ISCC-NBS COLOR NAMES EXHIBIT: There was an exhibit of drugs and chemicals named in accordance with the ISCC-NBS method, also an exhibit of soil colors, and a chart of color chips representing central notations for those ISCC-NBS names employed for the description of soil colors.

KNITTING ARTS EXHIBITION CANCELLED

THE 1942 Knitting Arts Exhibition, scheduled to be held in the Auditorium, Atlantic City, N. J., on April 27th-30th, has been cancelled. The announcement was made by the National Association of Hosiery Manufacturers, chief sponsors of the show.

Approximately 60 per cent of the space available had been contracted for, but entrance of the country into the war brought about a situation in which it was difficult, and in many cases impossible, for exhibitors to participate.

The 1942 show would have been the 38th annual exhibition. In past years it has been held annually in Philadelphia but some months ago it was decided to hold it every other year, and to hold it this year in Atlantic City.

In announcing the cancellation the hosiery association said it naturally had taken the action with keen regret. "But," it stated, "The present war is without precedent in size and in the extent to which it interrupts established ways. We feel that our exhibitors and members of the industry generally will support the decision made by our board. We also believe that when normal times are established the Exhibition will resume with the good will of all and will continue thereafter to render the valuable service which it has performed for so many years.

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American Association of Textile Chemists and Colorists

MARCH 16, 1942

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Members should notify the **Secretary** immediately of all address changes

CALENDAR of Coming Events

Meeting, New York Section, Swiss Chalet, Rochelle Park, N. J., March 27, 1942.

Meeting, Philadelphia Section, Hotel Philadelphian, 39th and Chestnut Sts., Philadelphia, Pa., April 10, 1942.

Meeting, Northern New England Section, April 10, 1942.

Meeting, Southeastern Section, Waverly Hotel, Columbus, Ga., March 21, 1942. A round table discussion will be held.

Research Committee and Council Meetings, North Carolina State College, Raleigh, N. C., April 18, 1942.

Meeting, Piedmont Section, Sir Walter Hotel, Raleigh, N. C., April 18, 1942.

Meeting, Mid-West Section, Schroeder Hotel, Milwaukee, Wis., April 18, 1942.

DYESTUFFS AND WAR*

R. D. HOWERTON

Calco Chemical Division, American Cyanamid Co.

IF THERE is one statement that can be made this evening without fear of contradiction, it is, that matters great and small, affecting every phase of our life, nation and international, are changing every day and probably every hour. And thus it is, that I crave your indulgence to remember that any statement I may make this evening may be only partially true next week; any prediction I may be bold enough to make, will only be taken as a suggestion on the trends indicated by what I can know right now.

One of the small things that is changing or has been changing up to the present moment, since I had the temerity to accept the assignment for this evening, is the nature of the remarks I have been planning.

We are all quite aware that war today is quite different from war as it was fought 25 years ago; in fact, the difference between the 1914-18 war and the present war seems so great as to have covered almost centuries rather than decades of time between them. Although the earlier World War was fought with the use of far more science and psychology than any previous war, this present enormous struggle more than ever utilizes every resource at the disposal of the belligerent powers. "Total War" is indeed the right word for it. In consequence, every phase of our life, industrial, economical, or personal, is almost bound to be affected by it and, probably, in some measure, hurt by it.

In the same manner, the situation in regard to our dyestuff picture, has changed as much, or more, between 1914 and 1942 as the war itself. All of us here, are familiar with the status of this industry in 1914 and appreciate the fact that it was almost nonexistent. There were a few scattered plants manufacturing the simpler colors, in a great many instances simply because there were by-products of other industries which could be utilized for the purpose. There were no plants worthy of mention in size, very few trained chemists familiar with the processes; actually, there were almost no research and development departments; and there was no familiarity with the necessary raw materials to be utilized in producing synthetic colors.

In the interim between the beginning of that war and the beginning of this war in Europe, the dyestuff industry by comparison with its condition at that time, grew and developed to a remarkable degree. By 1939 such plant facilities were in existence as seemed to guarantee no possibility of shortage in any dyestuff of importance. A large trained personnel of operating chemists, research and development chemists, and all the other numerous personnel required for its efficient operation and service to its customers made up its staff. In fact, this capacity not only appeared to be ample for purely dyestuff customers, it was ample to drive these very research and development men, to seek more and more uses for its products to enable it to grow and continue to operate economically.

In short, this industry was in such a state that, given a free flow of raw materials and complete control over its distribution, there need have been no shortage of any color for any purpose even though Europe fought for ten years or more. Then, let us examine into the reason why there seems to be a possibility of increasing shortages in this industry.

Any high school boy is familiar with the fact that a large proportion of the coloring matters used in all phases of our life, find their origin in the derivatives of coal tar. This common knowledge has probably made many lose sight of how many other things are necessary for the manufacture of these colors. In order to produce a full range of colors, a full variety of dyestuffs and pigments, the whole field of chemistry must be tapped by the producing plants. In speaking of dyestuffs and coloring matters, we must bear in mind that we refer to vat colors, naphthol colors, direct, diazotized and developed colors, chrome colors, acid, basic, acetate, sulfur, and a host of other colors. Looking in another direction, all of these various types go into myriads of uses; to name them all would be endless. They not only color the many forms of textile fibers, vegetable, animal, and synthetic; they also go into paper, leather, paint, printing ink, cosmetics, and other miscellaneous uses. There is probably no field of our lives not affected by colors from this industry.

To build and maintain the plant and equipment requires the whole range of metals, in large or small quantities, in all their forms and alloys. However, these metals are not only used for the building and maintenance of the plant and equipment, they are also used in many forms as actual reagents in the production of the intermediates and dyestuffs themselves. For a partial list (only to suggest its length and variety), aluminum, cobalt, manganese, magnesium, tungsten, molybdenum, iron, tin, zinc and many others, are required. Coal and oil are needed for heat and power; bricks, mortar, concrete, are needed to build a plant. Practically all alkalies and all commercially produced acids, mineral and organic, must be purchased or

*Presented at annual meeting, Mid-West Section, January 31, 1942.

made in the dyestuff plant. Huge quantities of water, treated to make it suitable for use, must flow every day in millions of gallons into these establishments. Sulfur, chlorine, phosphorous, common salt, and all the other more or less common and generally known chemicals enter into the picture freely and fully.

The above factors are mentioned chiefly to keep before us the realization that the same basic materials absolutely essential to the full production of colors, are needed in numerous other fields both for our regular civilian life and in even larger quantities for the production of war materials.

There is, however, another side of the picture which is equally significant. It was mentioned above that the dysetuff industry had constantly sought new uses for its intermediate products in order to enable it to make for you, more and better dyestuffs on a more economical basis. Such developments have lead the intermediate products into fields which are consuming its essentials for war purposes at a rate which will probably restrict their use for dyestuffs more and more each day and week.

Neither my knowledge nor the time at my disposal here, would permit me to point to all of these uses or even a fair proportion of them. Hence, I shall only attempt to suggest the whole picture by pointing out some of the better illustrations.

Both the raw materials we use and the intermediates we necessarily manufacture, go into explosives of many kinds, products for chemical warfare, pharmaceuticals, synthetic plastics, rubber, both natural and synthetic, as well as many other fields that could be mentioned.

Following are only a few examples relating essential materials to their respective dyestuffs as they will serve to illustrate the point adequately.

Anhydrous aluminum chloride, made by the action of gaseous chilorine on metallic aluminum, is used as a catalyst in the synthesis of anthraquinone, beta chlor anthraquinone, and beta methyl anthraquinone. The critical state of aluminum needs no emphasis. Also, we all know chlorine is very restricted but may not understand where it is going. A few of the uses of chlorine are in the manufacture of polyvinyl chloride, neoprene (for synthetic rubber), halowax for use in protecting ships against magnetic mines; tricresyl phosphate, and monochlorbenzene.

In addition to these outside uses of chlorine and the production of the catalyst, anhydrous aluminum chloride, it is also used as a reagent for the completion of numerous colors such as, Vat Blue BLD and BCS; Brilliant Green; Direct Red 8BL; Fast Scarlet 4BS; Malachite Green; Permaton Orange and Red; Sulfur Black; Vat Hydron Pink and Vat Violet 6R.

Phthalic anhydride, a derivative of benzine, which is used with aluminum chloride to produce the anthraquinone series of intermediates, is one of the most important factors in the production of synthetic resins.

These synthetic resins are not only used to form plastics for use in airplane manufacture as well as other essential places, but is used as the basis for paint which is used for ships and tanks, etc. Also phthalic anhydride is used in the production of smokeless powder. A partial list of colors made from these two products named above, phthalic anhydride and aluminum chloride, would include the following vat colors: Black BB, Blue BLD and BCS, Dark Blue BO, Gray RD, Golden Orange G and Golden Orange RRTD, Navy Blue NTD, Printing Black R, Yellow GC and the Vat Brown series used in dyeing the Army shades. They are also the basis for the manufacture of many of the alizarines: Blue Black, Cyanine Green and Red, Sapphire Blue the Bromos and Eosines; Acid Blues, Flourescines; Oil Blue.

So many of the dyestuffs are derived from aniline oil, it has given its name to the synthetic color industry. To begin to name even a partial list would be taking too much time. However, it may be well to mention a few of the essential war materials from aniline oil directly, or indirectly. Carbamide (diethyldiphenylurea) and diphenylamine are both stabilizers in the smokeless powder. Tetryl (which is trinitrophenylnitramine) is the booster charge for setting off the TNT with which we are all familiar. Aniline is also the starting point for the bulk of rubber accelerators and antioxidants. Not least in importance, aniline serves as the basis for the sulfa-group of drugs. Thus, you can understand why there is a potential shortage of the aniline derived intermediates such as dimethylaniline, acetoacetanilid, phenylethanolamine, and many others.

Toluene, another important starting point for many dyestuffs, hardly needs to be emphasized as it is, of course, the source of the important TNT, trinitrotoluene. A few of the related products may be named as Scarlet PRD or Primuline; the Sulfur Blues; and several of the direct colors commonly used, Developer MTD; and the Toluidine Pigments.

Beta naphthol is probably as widely used in the manufacture of colors as any other single product. It, too, has important uses in the rubber industry.

As mentioned above, this list makes no pretense of being complete; it is my only hope that it will serve to illustrate the whole point.

Prior to Dec. 7th, the question before our industry and Government seemed to be, "How much of our economy can we devote to defense and helping our potential Allies without disastrous effect?" In the past several weeks, it has become increasingly apparent we must ask our selves the question, "What and how much can be done to preserve our economy as we know it and still insure that our whole industrial set-up can be used to support our military establishment in prosecuting a war to victory over a very powerful combination of foes?" We cannot and will not believe that we will lose. On the other hand, it is imperative for all of us to believe that we can lose this war if we do not organize our full national effort to pros-

ecute it, and to let us be fully aware of the fact that such an organization of our total national resources is bound to affect and, in some measure, hurt each and every one of us, in every phase of his life, personal and business.

You and I must so conduct our business and adjust our frames of mind, to make every effort count toward this victory. If private industry in this country is to be maintained (and I believe it is the utmost desire of all to see that it is preserved), it must at one and the same time, supply all the contingents of war in materials and effort efficiently and, at the same time, be in shape to pay for all these things.

Although agencies in Washington have been working and studying for 18 months to attempt to understand how these things can be brought about, they have not, and cannot, accomplish this enormous task without the fullest cooperation of all men concerned with business in whatever capacity. Each of us must seek to find how his own business can be fitted into the job with all the resources at his command. To reduce the matter to simple terms, what can your business produce that will add to the war effort and, at the same time, continue your business as a going, profitable enterprise. Can you make uniform cloth, blankets, sweaters, helmets, or any other badly needed material? If you cannot do so with your present facilities, is it possible for you to adapt your business to such purposes? I can't answer that question for you, nor can any Government agency come and do the job completely for you.

Despite the fact that the agencies in Washington having this job assigned to them, have seemed to bungle and to accomplish little other than make your business difficult to run, they have done a great deal more than most of us realize. If any group of men present here now, were asked to do a job of spending a hundred million dollars efficiently for any purpose, we would find it a very tough job. For any group of men in the entire United States to seek to do a similar job with many times a hundred million dollars and still keep business running, is a much tougher job than any of us can dream. Consequently, mistakes have been made and more mistakes will be made. But, the past eighteen months of apparent floundering, have produced an enormous amount of information which can be whipped into reasonably decent shape for the job. Most of us are bound to agree the recent step of appointing one able man at the head of the War Industries Board to use all this accumulated information and experience, is a decided step in the right direction. But they are not coming to you individually to tell you what you can and must do. The job Donald M. Nelson is trying to do is too great to permit him to seek the individual business firm to do a job for him. It is up to you to use your own ingenuity, your trade associations, information you can get from your suppliers and your customers and from whatever Government agencies you can seek out to determine where your business fits into the picture.

That is your patriotic duty to your country if you believe your country is worth preserving. But also, it is your duty to yourselves and your business associates to help do this to preserve your own business. In a sense of the word, it is a very unpleasant task to be forced to say that I believe any man failing to do this will certainly find his business very badly handicapped and running the risk of not operating at a profit.

This country cannot spend more than half of its total national income for prosecuting this war, both in money and in all other resources (materials, man power, etc.) without cutting purely civilian production to a point where it hurts and hurts badly. To put the matter very concisely, if your plant is producing material the War Industry Board considers essential to the prosecution of this war, you will probably be able to obtain all necessary raw materials and intermediate products for the operation of your plant, and at a profit. If your plant is only set up to operate for what will be considered non-essential, you will probably not be able to obtain these materials in quantities you would like.

It is possible that there will be materials you can obtain for civilian production in varying quantities, simply because those materials would not be essential to the war economy. However, those materials will not necessarily be those you would desire both from a standpoint of quality and suitability for production in your plant.

The dyestuff industry has naturally found it impossible to do otherwise than to adapt its own production to the war economy. Not only patriotism and common sense would teach us to do this, but we have been in effect directed to do so by the Government. Hence, we feel sure there will be ample supplies of dyestuffs for all materials for which the Government will issue priorities or they will feel obliged to allocate to those purposes. On the other hand, we have not been blind to the fact that we have an obligation to those plants which cannot adapt themselves to the production of essential war materials and have made every effort to find ways to supply those people. Most of our efforts along those lines may be compared to the Irishman who wished to borrow a pair of scissors and a needle and thread in the middle of the night, in a country hotel. When asked what he wanted with these implements, he told them that his blanket would not cover his feet so that he was cutting a piece off the top and sewing it on the bottom. In spite of this fact, considering that so many of the fibers to which you would wish to apply dyestuffs will themselves be restricted, we believe there will be sufficient dyestuffs of a kind for the use of purely civilian production.

These products may not always be what you would want in fastness properties; they may sometimes cost more than better suited products; but, I believe, most of us are already willing to make sacrifices along those lines if the need be.

The Place of SULFUR COLORS in our War Production*

JOHN L. CRIST
Southern Dyestuff Corporation

IN THE preparation of this paper the purposes of our association as expressed in its by-laws have been kept clearly in mind, namely, "to promote increase of knowledge of the application of dyes and chemicals in the textile industry; to encourage in any practical way research work on chemical processes and materials of importance to the textile industry; and to establish for the members channels by which the interchange of professional knowledge among them may be increased."

It was well toward the end of the first World War and during the post-war period when sulfur colors of domestic manufacture became available to the textile industry. At this time some of these colors were rather poorly made, and the technique of application was not as far advanced as at present. Consequently, even though many sulfur colors were dyed and used successfully during this period, and during the decade following, unfavorable results were at times obtained. Here, as Mark Anthony said, "The evil is longer remembered than the good." It is now known, even in this period of something like twenty years ago, that many unfavorable results were blamed on sulfur colors when other factors such as preparation, stripping, aftertreating and finishing were really at fault.

By the time vat colors became available, we were, as present developments painfully prove, unfortunately maintaining an inadequately small force of more or less professional soldiers, sailors and marines, whose terms of enlistment were for relatively long duration. Therefore, the quantity of cotton goods required for our armed forces was correspondingly small and could easily be dyed with available vat colors. Since in many instances these goods were carried in storage for long periods, it was the logical procedure to specify vat colors for most cotton goods used by our defense forces. The procurement agencies remembered the relatively few unsatisfactory experiences they had had with sulfur colors and it seemed to them that these could be best avoided by specifying vat dyes.

Now that we are engaged in a full, all-out war effort with a greatly expanded armed force in all branches, and since a large portion of the cotton goods which are to be produced for and consumed by these agencies is intended for immediate distribution and use, and further since the present requirements are on such a tremendously large scale, a definite shortage of certain vat colors, strategic raw materials, and intermediates from which they are made has developed. It is therefore perfectly logical for our procurement agencies, and for the textile and dyestuff industries, to make a careful study and a thorough survey to determine if and where sulfur colors can be, and should be, specified and accepted instead of vat and other dyes. The speaker wishes to testify to the open-mindedness, sincerity, and desire to learn the truth on the part of our procurement agencies and government departments. They understand much progress has been made in the past twenty years and that more satisfactory and dependable results are obtainable with modern sulfur dyes applied by modern methods than were possible in the first world war.

By specifying sulfur colors wherever the requirements are such that this group of dyestuffs can be used to produce satisfactory and acceptable results, there is effected a tremendous saving in essential and strategic materials required by other agencies in this great war effort. For instance, most of the faster vat colors are made from the basic intermediate, anthraquinone. This, in turn, requires Phthalic Anhydride (in great demand for plastics), aluminum and chlorine in its manufacture, as well as large quantities of sulfuric acid and other industrial chemicals and intermediates of which there is a definite shortage. Then, when the dyestuff is to be applied on the cotton, sodium hydrosulfite is required, which needs zinc in its manufacture. It obviously becomes evident that whatever can be done to save vat colors will automatically save Phthalic Anhydride, chlorine, aluminum, sulfuric acid, zinc and many other essential chemicals and materials, all so vitally needed to produce war supplies used by the fighting forces. Sulfur colors also require some intermediates made from essential materials but the yield of sulfur colors from their intermediates and chemicals both in pounds of color, and in yards of cloth that can be dyed to a given shade, is so much greater than is true in the case of vat colors that the savings are tremendous. We will cite an example—

Meta Toluylene Diamine is of course made from Toluene, also the intermediate used in the manufacture of the explosive, TNT, which is in great demand. Yet, one pound of Toluene (which costs about 4 cents) made completely into MTD and then into sulfur dyes will produce sufficient sulfur khaki dyestuff to dye approximately 600 lbs. of cotton to the army OD-3 shade.

*Presented at meeting, Piedmont Section, January 24, 1942.

This, converted to four-yard goods, is the equivalent of 2400 yards or, let us say, approximately one and one-half miles of four-yard goods dyed to the OD-3 shade. Mind you, this is done from one pound of Toluene, costing 4c. This is a typical example of the tremendous leverage in the manufacture of sulfur colors from their intermediates considered either in pounds of sulfur dyestuff or in yards of cloth dyed therefrom.

In the manufacture of vat colors, much larger quantities of the organic intermediates and various chemicals are used than are required to produce equivalent quantities of sulfur colors. This is also true of equipment, time, labor, fuel, supplies, etc., because there are many more and longer process steps in the manufacture of vat colors than there are in the manufacture of sulfur colors. Specifying the use of sulfur colors instead of vat colors where it is logical to do so, greatly relieves the strain on these strategic materials. This is especially vital at this time, since the intermediate and chemicals used in the manufacture of vat dyes, and the processes in which they are made, parallel very closely the production of explosives and materials necessary for chemical warfare, all of which are used by and needed for our fighting forces. This also applies, to a degree, to sulfur colors, but, as pointed out above, to only a fraction of the extent as with vats.

Owing to the relative abundance of the intermediates and chemicals used in the manufacture of sulfur colors, and the relative ease and speed of production, there is not now, and it is not contemplated that there will be, a serious shortage in the colors of this class used for Army work such as prevails in the vat colors and the hydrosulfite necessary for dyeing them. There is in existence in the dyestuff industry, production capacity far in excess of the present demands for sulfur dyes. This capacity to produce can be further expanded much more easily and more quickly than is possible with vats, since the sulfur colors require fewer process steps, less equipment, and shorter time cycles.

The cost of dyeing the Army OD shades with sulfur colors as compared with the cost of producing the same shade with vat colors reflects the factors discussed above. As a general rule for comparison, the dyestuff and chemical cost to dye these shades with sulfur colors is from 1/7 to 1/12 the cost of dyeing the same shade with vat colors. In dyeing yarn and rawstock, considerably more production per machine per day is obtained when dyeing sulfur colors than when dyeing the same shade with vats.

It is felt that vat colors should be used to the limit of their availability on the finer counts of fabrics such as combed-yarn drills and twills and for fabrics that are to be made into garments which receive the most severe treatment. Outside of this field where maximum fastness is required and where the use of vats is clearly indicated, there are many fabrics which should be specified to be dyed with sulfur colors such as bedding materials, sleeping bags, linings, silicas, barracks or dunnage bags, Boy Scout clothing, Civilian Defense Corps clothing, black-out cloth, less expensive work clothing in the fighting forces, perhaps fatigue suitings, socks, cover-alls, webbings and other fabrics.

Sulfur colors as produced now by reputable manufacturers show great improvement over those colors available during the first World War. Likewise, the technique of application of this and other classes of colors, has shown much improvement. As a result of these two factors, goods can be dyed with sulfur colors now that are much faster to light and washing and which have no hazard toward tendering, such as was sometimes found twenty years ago. It is known that some instances of goods deteriorating in storage were blamed on sulfur colors when other factors were responsible. Until recently, little care or thought was given to the removal of all residual acidity following the aftertreating of sulfur colors as is commonly done with chrome and acetic acid, or copper and acetic acid, or a combination of copper, chrome and acetic acid. Yet it is a recognized fact that when Acetic acid is left in goods which are subsequently heated to high temperatures, tendering is brought about, regardless of whether these goods are dyed or with what class of colors, or are white goods.

Except in the case of full shades of sulfur black, there is no hazard of tendering of goods dyed with sulfur colors, if proper care and discretion are used in the selection of the colors and in their application. Even in the case of sulfur black, information and procedure are now available to the dyers which permit dyeing full shades of sulfur blacks and aftertreating them in a way to effectively prevent tendering in storage. There is very little sulfur black used by our Defense agencies; consequently this is a subject which falls somewhat outside the scope of this paper.

Since there were isolated cases of sulfur-color dyed goods deteriorating in storage after the first World War, it was deemed desirable by the procurement agencies to set up methods of testing and to write specifications by which dyers would know that their goods would not deteriorate and inspectors could check these results. After much careful work, it has been determined that accelerated tendering tests can be rather easily conducted to determine the amount of deterioration or tendering which takes place over a given period of time under ordinary storage conditions. This test is carried out as follows:

Samples to be tested should be checked as to alkalinity. It has been determined that residual acidity in the goods will accelerate tendering; consequently all goods dyed with sulfur colors that are aftertreated with acetic acid should be given a final rinse in dilute alkali (Soda Ash is entirely satisfactory) so that the goods will have a pH of not less than 9 after dyeing. Care should also be exercised in the finish of the goods to assure, after finishing, that the goods will be on the alkaline side, having a pH of 9 or above.

Goods to be tested are heated in an electric oven for

two hours at a temperature of 135° C. (275° F.) and then removed from the oven, allowed to cool to room temperature, exposed in an atmosphere of steam, as over a dye bath, for ten minutes. They are then replaced in the oven at the temperature of 135° C. and subjected to this heat for an additional period of two hours, with subsequent steaming. This treatment is repeated the third time, making a total of six hours heating, with steaming after each heating. The goods are then allowed to condition in the open atmosphere for 18 hours to regain normal moisture.

Breaking tests are made of both warp and filling (or on yarn if it is being tested) in sufficient number to obtain a dependable average. Similar breaking tests are conducted on a portion of the goods that was not subjected to the heat treatments. It is also desirable to run a blank check by heating a sample of the undyed goods, which has been similarly adjusted as to alkalinity along with the dyed sample. Break tests are conducted on the unheated undyed goods and also on the heated undyed goods and compared with the loss of strength of the dyed goods.

The percentage of strength remaining is calculated by dividing the remaining strength after heating, by the strength before heating. To be acceptable, goods should retain as much as 75% of their initial strength after this heating, which is considered to be equal to four and one-half years storage under normal conditions.

Since it has been found and definitely proven that the presence of organic or mineral acids in dyed and finished cotton goods will accelerate tendering of the goods when subjected to the accelerated tendering test, and that when these goods are finished to a pH of 9 or above, there is no appreciable tendering, the following method of testing the pH of the goods has been developed.

This procedure is intended to check dyed and finished cotton goods for residual acidity or alkalinity. A stock of distilled water containing a suitable wetting-out or penetrating agent to assure complete and rapid wetting-out, should be first prepared and adjusted to a pH of 9, with a dilute soda ash solution using a potentiometric or a colorimetric method.

10 grams of the goods to be tested is steeped in 150 cc. of the 9 pH water for one hour at room temperature (70° F.). Frequent stirring of the solution and goods is necessary to give accurate results. It is advisable to run a blank of water at the same time and under the same conditions as when the goods are steeped. After steeping the goods for one hour, they are removed and the pH of the water is again determined.

The final pH of all tested solutions should be 9 or above. Should the pH of the tested solutions be below 9, this is an indication that the goods contain some acid which will tend to accelerate tendering and the goods should be rejected. When the pH of the final solution is 9 or above, this is an indication that the goods are on the alkaline side and are therefore acceptable.

The speaker has in his possession samples of OD shades dyed with sulfur colors in 1924 that are now 17 years old. These samples have been stored under ordinary room conditions. The goods were aftertreated with copper and acetic acid and finished off in dilute soda ash. They are apparently as strong today as they were when they were woven. The pH is now approximately 8.0. He also has twelve-year-old samples of OD shades of goods dyed with sulfur colors that were aftertreated with copper and acetic acid and not neutralized after dyeing. The pH is now about 6.0. These goods show definite tendering; they have lost about one-half of their original strength. In fact, we have seen tests of goods that were properly dyed with sulfur colors and properly finished that actually resisted the accelerated tendering tests better than undyed white or grey goods.

To impart the ultimate in fastness to both light and washing, sulfur colors should be aftertreated with either copper or chrome. Aftertreatments with perborate or peroxide impair the fastness to both light and washing. Aftertreating OD shades with copper and acetic acid does not cause the goods to tender on ordinary storing, or when subjected to the accelerated tendering test, if the acid in the goods has been neutralized and if they have been finished off to a pH of 9 or above. The improvement in the fastness of goods dyed with sulfur colors, when aftertreated with copper or chrome, is considered to be due to the formation of the relatively inert chromium and copper color lakes formed in the goods. Since sulfur colors are more active in alkaline conditions than in acid, the formation of these lakes is more readily accomplished if the dyed goods can be aftertreated in a bath which is neutral or slightly alkaline. This is now being done with chromium salts with superior fastness and other desirable results. The oxidation of the sulfur colors by chrome and acetic acid or by any other agents does not improve the fastness of the color. As a matter of fact, the fastness is actually impaired by oxidation. It is the formation of the relatively inert metallic lakes which contributes so much to the improvement in fastness.

OD shades dyed with sulfur colors and properly aftertreated possess unusually good fastness to light. These shades properly selected and properly dyed will withstand approximately 75% as much exposure to Fade-O-Meter and to light as the same shade dyed with vat colors.

While there is no question but that the vat colors are more permanent and more durable, as a class, than the sulfur colors, and certainly vat colors should and will be used and specified for the better fabrics which have the most exposure to light and are most often subjected to laundering, yet sulfur colors, when properly applied, are durable, are relatively easy to apply, and are often as durable as the cotton goods on which they are dyed. In that great volume of cotton goods listed in part

previously which are used by our defense forces, the use of expensive vat colors made from vital and strategic materials of which there is a shortage, can hardly be justified when there are readily available sulfur colors of high quality made from materials which are relatively abundant.

Appreciation should be expressed to the officers and technicians in the Quartermasters Department, and to Mr. Lanier and Dr. Lippert of the War Production Board for their cooperation and helpfulness in working out the tests described herein, and for their untiring efforts in the solution of the many problems encountered.

Sulfur dyes are being, and will continue to be, used at a greatly accelerated rate. The manufacture of high grade sulfur colors, the continued development of better types and better methods of their application on goods for our fighting and defense forces, is constituting a worthwhile contribution to our all-out war effort. Those of us who are engaged in this work, whether it be in developing or in manufacturing or in selling the dyes, or in the dyeing and finishing of the goods, or in specifying the dyes and procuring the goods, can confidently feel that we are doing an important job in the conservation of strategic and essential materials.

This job, well done, will be our contribution toward helping our armed forces, and those of our Allies, beat the life out of the unscrupulous aggressor nations, with whom we are now engaged in this most gigantic of all wars, to preserve our national freedom and the American way of life.

MEETING, MID-WEST SECTION

THE annual meeting of the Mid-West Section was held January 31, 1942, at the Bismarck Hotel, Chicago Ill.

Herman Boxser, chemist of the Arcadia Synthetic Products Division, Western Felt Works, gave a most interesting talk on "The Preparation and Application of the New Synthetic Rubbers." This afternoon talk was illustrated with slides and moving pictures.

Dinner was served at 7:00 P. M. The business meeting was then called to order and the Nominating Committee, consisting of Edson K. Rice, James Scoon, Joseph H. Jones, Joseph F. Feit and Clarence W. Wille, announced that the following had been selected for the coming year. All were elected:

Chairman — Archie G. Alexander; Vice-Chairman — James Morrison; Secretary—Gordon Stott; Treasurer—Al Feit; Councilor—Elmer F. Smith; Sectional Committee—Herman Boxser, David Anderson, Clarence Wille, Edson K. Rice.

R. D. Howerton, Chicago Branch Manager of the Calco Chemical Company, Division of the American Cyanamid Company, then gave a most enlightening and timely talk on "Dyestuffs and War."*

*Appears on page P130, this issue

The meeting was then adjourned at 11:00 P. M.

Respectfully submitted,

J. Gordon Stott,
Secretary.

MEETING, PHILADELPHIA SECTION

A MEETING of the Philadelphia Section was held on February 27, 1942, in the Mirror Room of the Hotel Philadelphian, Philadelphia, Pa. An informal dinner preceded the meeting.

F. C. Atwood, President, Atlantic Research Associates, Inc., Newtonville, Mass., delivered an address on "Aralac," a wool-like fiber produced from casein, in which he outlined the general manufacture and properties of the product. He emphasized that Aralac was not to be considered as a substitute for wool, but a protein fiber miscible with wool, also with rayon, acetate rayon, etc., and other synthetic fibers, to produce a wide variety of fabrics and textiles. This was corroborated by the large display of practical mill-manufactured woven and knitting materials he had with him.

Joseph A. Wilson, Chief of Income Tax, U. S. Dept. of Internal Revenue, Philadelphia, Pa., delivered a short address on "Your Income Tax Returns" which was received by those in attendance with vital interest at this most opportune time.

It was decided at this meeting to hold the annual outing of the Philadelphia Section on June 12, 1942, place to be announced at a later date.

It was also voted unanimously to hold the annual convention in the Fall of 1942 at Atlantic City, N. J., time to be announced at a later date.

There were 109 members and 40 guests present at this meeting.

Respectfully submitted,

Boyce C. Bond,
Secretary.

Symposium on SHRINKAGE OF RAYON FABRICS

AT the January 23rd meeting of the New York Section a symposium on the shrinkage of rayon fabrics was conducted. Howard D. Clayton of Cluett-Peabody & Co. presented a paper entitled "Sanforizing as Applied to Rayons and Unstable Fabrics" and O. F. Marks of American Enka Corp. presented a paper entitled "Shrinkage Testing of Woven Rayon Fabrics." An open discussion took place after the presentation of the two papers. The papers and discussion follow:

Symposium on Shrinkage—

SANFORIZING

As Applied to Rayons and Unstable Fabrics*

HOWARD D. CLAYTON
Cluett-Peabody & Co., Inc.

I THINK most of you are familiar enough with the Sanforizing process so that it won't be necessary for me to describe that process. It is a mechanical method of shrinking cloth. As we all know, the big problem in the laundering of garments, or getting a garment that is going to maintain its size, is the controlling of shrinkage. Shrinkage is caused by a great many factors, and the main factor is the stretching that takes place in all of the preliminary processes. In the making of the cloth and in the finishing of the cloth, most of the processes have as a very important part the stretching of either the yarns or the fabric itself. To overcome that stretching, something must be done to bring the cloth back to its natural condition. Most of these causes are mechanical; therefore the easiest way to do it is to bring the cloth back by mechanical means.

Sanforizing, the process of compression, compressive shrinkage, pushes the cloth back to a predetermined amount. That predetermined amount is an amount that is discovered by making a regular wash test, the same kind of a wash test that the cloth will be subjected to in actual use. From the figures that are obtained by that wash test, the amount that the cloth is to be compressed is determined and the cloth is compressed on the Sanforizing machine that amount.

Those remarks apply to any fabric that can be Sanforized. The Sanforizing process has been used mostly on cottons. Cotton fabrics are much more stable than the other types of fabrics with which we deal, but it can be applied to any other type of fabric which is stable. By stable, I mean a fabric which, when it is subjected to a cleansing or washing process, to which it would normally be subjected in actual use in a garment, will come back to its natural condition after one or two or three launderings; such a fabric is stable. If it won't do that, if it stretches on the first washing or shrinks on the first washing, and then stretches on the second, or shrinks a little bit on the first, more on the second, more on the third, more on the fourth, and so on, a fabric of that kind is not stable and it cannot be Sanforized successfully. That very briefly is about all there is to the Sanforizing of unstable fabrics.

*Presented at meeting of New York Section, January 23, 1942.

I know there are quite a number of people here tonight who are engaged in the business of Sanforizing fabrics, and they have undoubtedly Sanforized rayon fabrics successfully. There are a great many rayon fabrics that could be classed as stable fabrics, fabrics which, when they are washed, will shrink the same amount each time they are washed.

If you have a fabric of that kind, you can determine the amount of shrinkage and Sanforize such a fabric, but if you have a rayon fabric which will not be stable, which will not react uniformly on repeated washings, then the Sanforizing process does not cure the trouble.

There are a number of finishing processes that are being used which do a pretty good job of stabilizing. The thing that must be guarded against with such processes is to be sure that that stabilization is permanent. I know of certain finishes which will retard shrinkage so that there will be practically no shrinkage at all after the first wash, but after four or five washings the stabilizing material is removed from the fabric and then it will shrink just as badly as it did before.

Obviously, if we Sanforize such a fabric as that, it may be quite satisfactory to the customer after the first or second use, but after the fifth or sixth time trouble occurs. That can't be blamed on the Sanforizing process. It will have to be charged back against the unstable nature of the fabric.

I think a lot more can be gotten out of a paper of this kind if we open it to discussion and have those who have questions to ask, ask them. I don't know whether I can answer them myself or not, but there are people in the audience I am sure who have quite a knowledge of the handling of these different fabrics and who will be glad to help out and answer any questions which we cannot answer from the table here.

Chairman Tisdale: In view of the fact that both these gentlemen are talking about similar subjects, and that questions may cross and recross their talks, we will proceed with the paper by O. F. Marks of the American Enka Corporation, who will talk on "Shrinkage Testing of Woven Rayon Fabrics." At the close of this talk you are at liberty to ask all the questions that come to your minds.

(Discussion appears on page P140)

Symposium on Shrinkage—

SHRINKAGE TESTING

of Woven Rayon Fabrics*

O. F. MARKS
American Enka Corp.

MY PAPER tonight consists of a preliminary report on some committee work as chairman of the Rayon Shrinkage Committee.

For a number of years the AATCC has had a tentative method for determining the shrinkage of fabrics other than cotton. This has been published repeatedly in the Year Book under the official and tentative standard text methods. This method has been criticized severely from several quarters when it has been used in determining the shrinkage of rayon fabrics. While it is the best method available, it was felt that some better one should be found before it was adopted as an official standard method. Therefore, it seemed advisable to have a separate committee to specifically carry on a further investigation of the shrinkage of rayon fabrics. A committee has been appointed for this purpose consisting of the following members:

F. J. Ariente
E. H. Benzinger
F. Bonnet
E. P. Brennan
Albert Ruth
Gorham Cluett
M. P. Epstein
J. Goldberg
D. J. Knowland
J. Knup
E. Freedman
W. F. Macia
Sherman Monroe
J. B. Quig
W. B. Sellars
William Winkler

The first undertaking of the Committee on the Shrinkage of Rayon Fabrics was to investigate the present tentative method to see if it was satisfactory for (1) the determination of the maximum shrinkages of rayon fabrics, and (2) the determination of the uniformity of results from laboratory to laboratory and from individual test to individual test. For this investigation eight swatches of rayon fabrics of various constructions and yarn contents were sent to eight laboratories for three tests on each fabric. The laboratories were requested to follow the test procedure as outlined in the AATCC Year Book, but when the results were received, it was found that some of them had deviated from this procedure. The results from laboratory to laboratory showed considerable variations. For instance 7 per cent gain in the filling was reported. There were also great variations within the tests made on one fabric in the individual laboratories. Space does not permit a review of the figures of all of the tests, but the report of the tests on one of the fabrics is given in Table 1. This fabric was a triple sheer; loom construction 104 by 72; the reed width was 46 inches; the warp was 75/60 rayon crepe, and the filling 75/60 rayon.

As well as considerable variations in the results from laboratory to laboratory and from test to test in the individual laboratories, it was found that the equipment used in making the tests varied considerably from laboratory to laboratory; for instance, one laboratory used a 24-inch flat-bed press, while others had a smaller type flat-bed press, and still others had none at all, making it necessary to use a hand iron.

We have appointed a subcommittee to investigate the cause of these shrinkages, and I can say that they are now working on this matter, but it is in such a state that nothing can be reported on their results.

There is some question in the committee's mind regarding the suitability of the maximum shrinkage test for fabrics which are inclined to shrink excessively. What I mean by fabrics that shrink excessively are the well known crepe constructions. We are all familiar with the fact that there are many fabrics woven today which will go through the average commercial dry cleaning establishment, even when these fabrics are wet cleaned, with very little trouble. If any of you would like to ask questions on that later on, I will be glad to answer all I can.

Since garments made of these types of fabrics are usually wet cleaned at some period during their life, it seems that their ability to be restored to their original size or shape is important, and some method should be available for measuring their restorability. After the completion of the investigation of the maximum shrinkage tests, the committee will undertake to obtain a test pro-

*Presented at meeting, New York Section, January 23, 1942.

TABLE 1

Laboratory	Finished Width	Thread Count Before Testing Warp	Thread Count Before Testing Filling	Thread Count After Testing Warp	Thread Count After Testing Filling	Shrinkage Moist State Before Pressing Warp	Shrinkage Moist State Before Pressing Filling	Shrinkage After Pressing Warp	Shrinkage After Pressing Filling
1	38¾			115	84	9.5	7.0 G	10.5	1.0 G
		117½	75	115	84	9.5	6.5 G	10.0	1.5 G
				116½	84½	9.0	7.0 G	10.0	1.5 G
Average	38¾	117	75	115	84	9.3	6.8 G	10.2	1.3 G
High						9.5	7.0 G	10.5	1.5 G
Low						9.0	6.5 G	10.0	1.0 G
Difference High Low						0.5	0.5	0.5	0.5
2	38¾	119	76	111	87	10.0	7.0 G	10.5	5.7 G
3	38⅞	119	75	113.3	80.3	8.5	6.5 G	8.5	6.0 G
				117.7	84.0	11.0	8.5 G	9.5	7.5 G
				115.7	83.7	9.0	4.0 G	9.0	3.5 G
Average	38⅞	119	75	115	82	9.5	6.3 G	9.0	5.3 G
High						11.0	8.5 G	9.5	7.5 G
Low						8.5	4.0 G	8.5	3.5 G
Difference High Low						1.5	1.5	1.0	4.0
4	38¾	120	76	112	80	4.9	3.5 G	4.9	2.2 G
				112	83	9.0	6.7 G	9.0	3.4 G
				112	82	6.3	3.5 G	5.4	2.8
Average	38¾	120	76	112	82	6.7	4.6 G	6.4	2.8 G
High						9.0	6.7 G	9.0	3.4 G
Low						4.9	3.5 G	4.9	2.8 G
Difference High Low						4.1	3.2	4.1	1.6
5	38.6	119	76	115	85	10.3	6.1 G	10.6	2.9 G
		119	76	119	84	10.3	5.9 G	10.7	1.4 G
		119	75	118	84	10.2	5.5 G	10.6	0.2 G
Average	38.6	119	76	117	84	10.3	5.8 G	10.6	1.5 G
High						10.3	6.1 G	10.7	2.9 G
Low						10.2	5.5 G	10.6	0.2 G
Difference High Low						0.1	0.6	0.1	2.7
6	38¾	120	75	117	83	7.0	4.0 G	7.0	2.5 G
						8.9	4.5 G	9.1	2.5 G
						7.0	4.5 G	7.4	2.5 G
Average	38¾	120	75	117	83	7.6	4.3 G	7.8	2.5 G
High						8.9	4.5 G	9.1	2.5 G
Low						7.0	4.0 G	7.1	2.5 G
Difference High Low						1.9	0.5	2.0	
7	38⅞	119	75					10.1	4.9 G
								10.7	4.5 G
								10.1	5.6 G
Average	38⅞							10.3	5.0 G
High								10.7	5.6 G
Low								10.1	4.5 G
Difference High Low								0.6	1.1 G
8	38 11/16	119	75	118	80	5.0	6.0 G	8.0	1.0 G
						5.0	7.0 G	8.0	1.0 G
						5.0	6.0 G	6.0	1.0 G
Average	38 11/16	119	75	118	80	5.0	6.3 G	7.3	1.0 G
High						5.0	7.0 G	8.0	1.0 G
Low						5.0	6.0 G	6.0	1.0 G
Difference High Low							1.0	2.0	
				Summary					
1	38¾	117	75	115	84	9.3	6.8 G	10.2	1.3 G
2	38¾	119	76	111	87	10.0	7.0 G	10.5	5.7 G
3	38⅞	119	75	115	82	9.5	6.3 G	9.0	5.3 G
4	38¾	120	76	112	82	6.7	4.6 G	6.4	2.8 G
5	38.6	119	76	117	84	10.3	5.8 G	10.6	1.5 G
6	38¾	120	75	117	83	7.6	4.3 G	7.8	2.5 G
7	38⅞	119	75					10.3	5.0 G
8	38 11/16	119	75	118	80	5.0	6.3 G	7.3	1.0 G
Average						8.3	5.8 G	9.0	3.1 G
High						10.3	7.0 G	10.6	5.7 G
Low						5.0	4.3 G	6.4	1.0 G
Difference High Low						5.3	3.3	4.2	4.7

G Denotes Gain

cedure for determining the restorability of certain types of rayon fabrics after washing or wet cleaning.

It is the intention of this committee to work with the ASTM committee, or any other organization who would like us to work with them.

(Discussion follows on next page)

DISCUSSION

Mr. Schuster: Did any of the laboratories use that machine which was shown at the ASTM meeting on shrinkage?

Mr. Marks: You will notice that we stated that we were using the test procedure as it appears in the Year Book, and that we have to obtain some method whereby we can get results from laboratory to laboratory using the maximum shrinkage.

Mr. Schuster: I understand that, but did any of the laboratories use that machine?

Mr. Marks: No, sir, not on these tests.

Mr. Harris: Mr. Marks, are your remarks concerning denier or spun rayon?

Mr. Marks: Some fabrics were spun rayon and some were denier rayons.

Dr. Stiegler: Mr. Clayton mentioned the fact that unstable fabrics were questionable. Maybe that is questionable. Many years ago we were told to keep caustic away from wool. That statement was challenged as it was made. One man got up and said, "We have been using caustic on wool for two years," and the same may hold true in this situation. On the question of wet cleaning, many people don't know to what extent rayon garments are wet cleaned. How many would trust their worsted suits to water and soap, and how many would toss their rayon garments, clothing and dresses, into water and soap? Yet, it is being done.

Maybe unstable fabrics are also being Sanforized by someone here. So if you have any comments on that phase of the situation, please feel free to talk about it and get each other's viewpoints on the problem.

Mr. Rose: Mr. Clayton, are rayons being Sanforized at all? And how can you tell whether they can be Sanforized? I mean, can you make any sort of a test to tell whether they can be Sanforized?

Mr. Clayton: Yes, there are quite a number of rayons that are being Sanforized, and the most satisfactory test to make is a repeated wash test, and the only wash test that we have at present is the one that is mentioned in the AATCC Year Book, the one about which Mr. Marks spoke, which is a mild washing procedure. If you find on repeating that test three(or four, or five times that the fabric is stable—by stable I mean, suppose at the first wash you get a shrinkage of a half per cent, on the second wash a shrinkage of .6 of a per cent, the third wash, .7 of a per cent, and the fourth wash, .5 of a per cent; that means you have a pretty good indication there that that fabric is stable and you will get satisfactory results.

However, if you find on the first wash that that fabric, we will say, shrinks half a per cent, the next wash, 1 per cent, and the third wash, 2.5 per cent, you know that such a fabric is not stable. You know that whatever the condition is that has prevented its shrinkage its full amount the first time is being changed by the washing, and that eventually you will have a garment that is going to show a shrinkage that is outside the tolerance of the Sanforizing guarantee.

Mr. Rose: You mean that you repeatedly wash the same sample?

Mr. Clayton: The same sample. That sounds like a cumbersome way to do it, and it takes quite a little time, but I don't know of any other way, or any simpler way to do it.

Mr. Rose: Is that true both of spun rayons and filament rayon fabrics?

Mr. Clayton: Yes, it would be true of any fabric.

Chairman Tisdale: What would be the object of making a cloth of an unstable fabric in the first place?

Mr. Clayton: That isn't a question that I can answer. I think one answer might be that rayon is a fiber that makes a very nice garment. It is something that people want.

Chairman Tisdale: Well, maybe they want it, but if a woman buys a dress made of that unstable fiber you talk about and after washing it once it becomes too small, she has to buy another one. It is a good thing for the manufacturer but it is kind of tough on the customer.

Mr. Clayton: That is very true, but that is what has happened a good many times.

Mr. Chandross: Mr. Clayton, would you or somebody read from the AATCC procedure as to ironing? Does that call for shaping, or purely flat press?

Mr. Clayton: Let's start with the drying:

"The samples shall be removed from the wheel and the excess water squeezed from them by hand. Wringing by hand or with squeeze rolls is not permissible as either may distort the cloth. The samples shall then be spread out on a horizontal screen or similar perforated surface and dried in a current of air. If a heated drying chamber is not available, the samples may be dried at room temperature in a current of air from an electric fan. The dried samples shall then be dampened with water and allowed to stand for 5 minutes.

"Pressing: The samples shall be pressed either with a flat-bed press or a hand iron, care being taken in handling them to avoid any strain on the cloth. Each sample shall be smoothed to remove wrinkles before pressing. When a hand iron is used, the iron shall not be slid back and forth on the sample but simply pressed down upon it in a manner simulating the action of the flat-bed press. The specimen shall be allowed to cool before it is measured."

That is the recommended procedure by this method.

Mr. Chandross: Do the figures that you have available, Mr. Marks, indicate a difference between those laboratories which use the iron and those which use the flat-bed press, or don't you have them subdivided that way?

Mr. Marks: I don't have them subdivided.

Mr. Winkler: You speak of Sanforizing as a mechanical process. They have certain products that are applicable to boiloff or scouring operations which are supposed to determine the shrinkage of your goods. I would like to

know what the products are, the names they are sold under, and the permanency of the results obtained.

Mr. Clayton: I don't know that I understand your question exactly. Are you referring to the so-called Sanforizing assistants which people use, or are you referring to treatments which prevent the cloth from shrinking?

Mr. Winkler: I understand that there are certain products that are used in the boiloff to determine your shrinkage, to prevent further shrinkage.

Mr. Clayton: I don't know whether I can answer that or not. In the finishing of any fabric certain things are used to give that fabric a desirable hand. Let's take a cotton fabric, for instance. You first boil it out thoroughly in a kier boil, and it is bleached. Then it is finished with certain finishing agents. Sometimes starch is used, sometimes sulfonated oils, and sometimes stearate softeners.

The most desirable finish on a cloth, to get the best results in Sanforizing, is a finish which will make that cloth absorbent, because the Sanforizing process works best when the fabric is moist enough, so that it will be compressed easily. A perfectly dry fabric can be compressed, but it won't keep that compression after it has been removed from the machine.

. . . Referring to Chart. . .

I might say here, this sketch shows the Sanforizing machine. The cloth comes to a couple of rubber feed rolls after it has been finished in the finishing plant. It goes through these feed rolls and is sprayed with a light spray of water. It then goes through this device which is a skyer, which allows sufficient time for that water to penetrate the cloth. During that procedure, the cloth shrinks in the width-wise direction. The amount of shrinkage that will take place is determined by the way these rolls are set and the amount of tension that is put on the cloth as it is fed in here around this feed roll to make the reverse curve around the large drum.

The width is governed by a clip tenter which is set to bring the cloth out to the width that the wash test has said that it should be, and that, of course, is assisted by this moistening.

If the cloth is absorbent so that the water soaks in easily, we will get the best Sanforizing results. There are a lot of different things that are used as wetting out agents to make the cloth more absorbent. Is that what you have in mind?

Mr. Winkler: No, it isn't.

Mr. Clayton: Maybe you are referring to resin finishes.

Mr. Winkler: Let me help you on this question a little bit. I think the whole question was misunderstood. There are products on the market which you add to the boiloff bath, for instance, in stripping your rayons, which will set your shrinkage at a certain percentage. You can't determine it within one or two per cent, but say between two or three per cent. And the goods will stay at that shrinkage. They will not shrink afterwards on wetting out again. The question is whether you know of any such products, what you think of them, and what they are?

Mr. Clayton: No, I don't know of any that I would recommend.

Mr. Kapelsohn: Is there any system being set up whereby there could be a check on these newer fabrics that are being Sanforized to make certain that fabrics which are not sufficiently stable in shrinkage are not put through the process and put out on the market with "Sanforized" tags, when they shouldn't be put out?

Mr. Clayton: I wonder if you all heard that question? The question was asked if any system is being set up whereby fabrics which are put on the market with a Sanforizing tag have been or can be tested to be sure that they will be permanently Sanforized. Is that what you meant?

Mr. Kapelsohn: Yes.

Mr. Clayton: The only procedure that we have is this one that I outlined, using this wash test, repeated five times. That information is in the hands of all of the Sanforizing licensees and is available for their use.

Dr. Draves: The licensee determines himself whether or not he thinks he is doing a good job?

Mr. Clayton: Of course, speaking for the Sanforizing division, we have a number of service men who call upon the Sanforizers and check up on what they are doing, but as a general thing the licensee is the one who is responsible for doing a good job. If he needs assistance, he comes to our service department for it.

Mr. Phillips: Mr. Clayton, perhaps this is out of order, but in connection with what was said about chemical treatments, I am under the impression that about a year or so ago there was publicity given to a new chemical method of pre-shrinking which was patented by Cluett-Peabody. It was mentioned in the trade journals as Sanforset. I think that is what several of these people are thinking of.

Mr. Clayton: Maybe you are right. Maybe that is what several of them are thinking of. (Laughter) If you will notice, that was not the subject of this address for this evening. (Laughter) That is an entirely different process, and it is a process that is being used in a limited way at the present time. However, it has not as yet a very wide usage. It is a good process, but it requires very careful scientific control and operation, and it has not been promoted very extensively as yet, because there are developments in it which are being worked on. We want to make it a better process than it is today. That is about all I can tell you about Sanforset.

Mr. Smith: What is the problem in connection with shrinkage of rayons when mixed with some of these new fibers such as casein fiber? Has there been any consideration given to that?

Mr. Clayton: Well, the same thing would apply no matter what the mixtures are. If the fabric is not stable, it is going to change every time it is washed, and you can't do a satisfactory job of shrinking it. There are a number of treatments, resin finishes and so forth, that are being used

today which do a pretty good job of stabilizing some of these rayon fabrics and some of the mixtures.

Mr. Carey: Mr. Clayton, would you mind telling me the basic principle of Sanforizing? Not the treatment but the basic principle. I will go a little further. I have an idea in my own mind what it is. Probably you could clarify it. I will say a piece of wood is compressed with any amount of pressure in dry form, and a ridge is compressed in the wood in dry form. When soaked in water, that ridge will rise to a certain extent. Beyond that it won't go. I was wondering if that procedure was the same in the cellulose process or not, whether you dry them, then wet them, if they swell to a certain diameter and don't go any further beyond that.

Mr. Clayton: I don't know whether I can explain that to you as clearly as it should be or not.

. . . Referring to Chart. . .

This little diagram here illustrates the principle of the Sanforizing process*. This is a woolen blanket which passes around a feed roll, a small feed roll. Say, it is two inches in diameter. The blanket, let us say, is a quarter of an inch in thickness. The surface of the blanket in passing around this roll is in a stretched condition, and the cloth is pressed against it and held firmly by means of an electrically heated shoe. The blanket passes from this roll to the main cylinder and the blanket surface is shortened because it has changed from a curved condition to a straight condition. The shortening of the blanket surface forces an equal shortening of the cloth since the cloth is held too firmly against the blanket to slip or wrinkle. As the blanket and cloth leave the feed roll they are immediately brought into firm contact with this large heated cylinder around which they travel.

Being slightly moist, the fabric goes around this drum and is dried, and the drying of the moisture fixes it in a condition so that it stays compressed to the amount that it has been retarded in its travel around the drum.

Mr. Carey: Is there any drying done to the cloth at all before it is moistened?

Mr. Clayton: It is finished in the regular manner that any fabric would be finished in a finishing and bleaching plant. It is thoroughly dried before it goes to the Sanforizing machine.

Mr. Carey: On drying cylinders?

Mr. Clayton: Drying cylinders or on a tenter. Whatever the plan is that is used.

Mr. Carey: What would happen if you put through a piece of cotton that hadn't been dried?

Mr. Clayton: You could do a pretty good job of shrinking it that way, but it would be more difficult to control it uniformly. It has been done that way, and some fabrics can be done that way, but I think you would have to make a lot more tests than you would normally want to do, and you won't get uniform results all through the lot.

Mr. Carey: You say that the drying procedure is essential before the Sanforizing?

Mr. Clayton: I would say it is advisable with most fabrics for uniform results.

Dr. Coughlin: Some mention has been made of the dry cleaning ability of fabrics to go with the subject of wet cleaning. From several years of intimate connection with the dry cleaning industry, I find that several years ago the average dry cleaner would have demanded that all fabrics be preshrunk. In other words, he hated to see garments go out of his place which probably were a size or two too small. In fact, a prominent dry cleaner in St. Louis wrote an article and gave a radio talk entitled, "Don't hang that crepe on my door," because the crepe would go back two or three sizes too small, with the consequent kick from the customer.

The cleaners found that certain fabrics are unstable and can't be stabilized from the standpoint of shrinkage. They now find it necessary and desirable, in the major dry cleaning plants throughout the country, to measure the garment, especially of crepe construction, before it comes into the plant. Then, if that has to be submitted to wet cleaning—and I might say that they submit garments to wet cleaning wherever there are many water soluble stains throughout the garments, such as food, liquor, and so forth—they will have a measure as to how far they must restore that garment. Whether the rayon crepe in question shrinks two per cent or four per cent, it makes no difference whatsoever with them because they restore it through the steaming and stretching method to its proper dimensions.

The only thing that the average dry cleaner today demands in a rayon crepe is that after it is restored to its proper shape it shall remain there through various degrees of absolute humidity. In other words, he doesn't want the garment to stretch out a couple of inches while it is being delivered on a wet day on a truck. I might say also that the average dry cleaning plant today has almost no trouble whatsoever as far as shrinkage is concerned, if they carry out these measurements. There are crepe fabrics on the market which are not stabilized to the extent but what they will, under atmospheric changes of humidity, go either short or long. But the average crepe garment today is no longer a headache to any dry cleaner and he is not interested at all in whether it has a shrinkage of four or five per cent, because he measures it and restores it. It is just as easy for him to pull the garment out six inches as it is to pull it out two inches.

The only thing he kicks about is that the garment which is put up is under a condition of strain whereby when it is restored to that condition it is likely to either shrink or stretch after he has restored it to its proper dimensions. The troubles today from shrinkage are at a very minimum in the average dry cleaning plant.

Mr. Marks: I would like to add something. During the

*The Sanforizing process was also discussed at a meeting of the Rhode Island Section on October 24th, 1941 by William H. Harriss of Cluett, Peabody & Co., Inc.

past year and a half I have been doing considerable work in a dry cleaning plant. Last Easter week I was in the plant, and they put through 70,000 rayon crepe and other combinations of rayon and acetate fabric dresses. Out of these 70,000 dresses only 150 were returned due to shrinkage. No measurements were made on any of these dresses. The average number of wet cleanings during this period was between 10 and 15 per cent each day. Understand, no measurements were made of any garment. Most of the returns were due to uneven hem lines, which were caused by the cyclone blower used in the dry cleaning plant to restore the dress to shape after wet cleaning.

Dr. Stiegler: I don't believe any information has been given as to yardage of spun rayon that is shrinkproof or that is being put through the Sanforizing process. Perhaps someone can comment on that. Just how much spun rayon is being Sanforized? We must face this fact: I think everyone admits that the consumer wants to wash spun rayon. The textile group in this room ought to have some answer as to what is going to be done about it. The public is going to demand spun rayon that is washable.

You have your committee chairman here tonight. Are there any comments you wish to make as to what your Association ought to be doing along these lines? Are the tests inadequate? Should they be expanded? Your chairman, I am sure, will consider any comments that might be made and will put them before his committee. The committee has been recently organized. There was a meeting of the Research Committee in Boston last Saturday and his report was made there. He will report again. I am sure he will get his committee to work on any suggestions that might be made.

Personally, I don't know whether anyone is really Sanforizing spun rayon. Unquestionably the designer fits into the picture somewhere as to the construction of the rayons. The householder doesn't care who is involved. She wants spun rayon that may be washed. We ought to have some sort of an answer on that here tonight. Does anyone know whether spun rayon is really being Sanforized satisfactorily?

Mr. Clayton: Dr. Stiegler, I think I could say this: that there is very little spun rayon that is being Sanforized. There is some, but very little. The reason is that most of the spun rayon fabrics do not show the necessary stability to be Sanforized.

Mr. Chandross: Isn't part of that answer that we haven't yet gotten enough data together to indicate the advantages or the desirability of the various methods for finishing as compared with each other. Wouldn't it be in order here to suggest that that be undertaken as part of that study, if we are to answer the consumer's problem as to what to do about spun rayon shrinkage? There are certainly other methods of Sanforizing, and I think the question was asked about another method of shrinking. I am familiar with one of them. One company has done some interesting work on stabilizing with the resins. There are undoubtedly many channels that have been partially explored and that should be brought to light before the problem is made to sound as hopeless as it seems to be. I think the committee ought to look into this.

Mr. Blum: Is it not necessary to subdivide the question in speaking of spun rayon between spun rayon piece dyed goods and spun rayon stock dyed goods, because you will find that, when you do divide these and treat each one separately, there is an altogether different history in each of them.

Chairman Tisdale: I think Mr. Blum has brought up an interesting point. Years ago, when I was in the silk business, I handled nothing but skeins. All the piece goods were sent down to Paterson to be dyed. The skein goods were woven in our plant in very tight constructions like the taffetas. Perhaps Mr. Marks has some experience on finishing the cloth of those two different types of construction, yarn dyed or piece dyed.

Mr. Marks: I have something, but I can't disclose it.

MEETING, NEW YORK SECTION

THE last regular meeting of the New York Section was held on Friday evening, February 27th, 1942, at the Chemists' Club, New York City. An informal dinner preceded the meeting.

The chairman called attention to the social evening scheduled for April 24th and the annual outing scheduled for June and asked the members to submit opinions to him regarding the advisability of holding them this year in view of the war situation. He also requested that members submit suggestions for a paper to be presented by the New York Section in the Intersectional Contest at the annual meeting to be held this Fall under the auspices of the Philadelphia Section.

Dr. Robert E. Rose, past-president of the national organization and director of the technical laboratories of E. I. du Pont de Nemours & Co., Inc., presented a paper entitled "How Dyes Dye." Considerable discussion followed its presentation.

The total attendance was 160.

Respectfully submitted,

NORMAN A. JOHNSON,
Secretary.

LAPEL BUTTONS bearing the seal of the Association may be purchased by members in good standing, from the Secretary for $1.50 each.

UNEMPLOYMENT REGISTER

Members of this association, who are without employment, should forward to the secretary a statement as to their qualifications and experience. This information will subsequently appear on these pages with an identifying key number. Employers are also requested to file with the American Dyestuff Reporter any vacancies which may occur in their business.—H. C. Chapin, Secretary, Lowell Textile Institute, Lowell, Mass.

NOTICE TO EMPLOYERS

Personal Histories and Employment Records of the following applicants are on file at the office of the American Dyestuff Reporter. Prospective employers may examine them without obligation.

Key: A—Laboratory and research; B—Dyeing or printing; C—Finishing; D—Sales; E—Instruction; F—Executive.

NOTE: PERSONS WHO HAVE OBTAINED EMPLOYMENT SHOULD NOTIFY THE SECRETARY OR THE AMERICAN DYESTUFF REPORTER AT ONCE.

A-1

Education—Graduate textile chemistry and dyeing course, Lowell Textile Institute, 1932. Special course in colloid chemistry at M.I.T.

Experience—Library work in spare time while attending school; five years as assistant chemist with knitting mill, duties consisting of testing and grading silk, testing of oils, soaps, dyes, finishes and other chemicals, making up specifications for various lines of hosiery and checking finished product, keeping a check on production costs, control of waste and irregulars, checking competing products and carrying on research to improve product and reduce costs. Woman; age 30; references.

A-2

Education—B.T.C., Lowell Textile Institute, 1933.

Experience—Textile chemist, cotton and rayon thread; agricultural chemist, protein, fat and mineral analysis; special Federal inspector on textiles, New York City; U. S. inspector, war department; chemist-spotter, dry cleaning experience. Age 32; married.

A-3

Education—B.S. in chemistry, Lehigh University.

Experience—Experimental engineer and analytical chemist, 8 mos.; assistant superintendent of silk corporation, assisted in planning and directing production, in charge of laboratory, technical work, personnel, purchasing, etc., 2 years; inspector of ordnance material, to the present. Seeks position as chemical engineer or chemist.

Age 25; single; references.

A-B-9

Education—Textile School Graduate; Alexander Hamilton Institute Business Course.

Experience—Mature, executive type of textile chemist and colorist with over twenty years' broad general experience in factory, laboratory, purchasing and all around business procedure. Good correspondent. Excellent personality. Wholesome appearance. Fine speaker. Literary and artistic ability. Real color sense. Possesses fund of factual information about material things in a wide range of industries. Capable of meeting the highest type of clientele and planning and directing the efforts of all types of personnel. Desires supervisory, contact, promotional or sales work. Willing to prove ability and versatility.

Age 44; American born; New England Yankee ancestry; married.

A-B-16

Education—3 years analytical textile chemistry and 2 years textile dyeing at Rhode Island School of Design.

Experience—6 years assistant research chemist at cotton finishing plant. Had charge of putting all research into production; complete study of starches, dextrines, gums, resins, finishing oils, softeners and sulfonated oils; considerable microphotography experience; wash and light tests on dyestuffs; knowledge of all cotton finishing operations; experience in water treatment; recent experience as dyer of wool, cotton, rayon (stock and piece goods), and mixtures. Seeks position as chemist, dyer or laboratory technician.

Age 30; American; married; references.

A-B-17

Education—Graduate of Franklin Union and Lowell Textile Institute, 1942.

Experience—1936 until present as assistant dyer in hosiery dye works. Experienced on full fashioned and anklet hosiery, handling wool, cotton, silk, rayon and nylon and combinations; has charge of weighing dyestuffs, testing and shade matching; experience with hosiery dyeing machines of all sizes. Seeks position as assistant dyer or laboratory technician.

Age 24; married; references.

A-B-18

Education—Graduate Philadelphia Textile School, 1940.

Experience—Has experience as assistant chemist and trouble shooter in silk dyeing and finishing plant; as manager of laundry store; and as printer and colorist in screen printing plant. Seeks position in laboratory and research, dyeing, printing or finishing.

Age 21; single; references.

A-B-C-F-3

Experience—Broad experience since 1906 as overseer of finishing, general researcher, trouble shooter, overseer of dyeing, general superintendent, mill manager. Experienced in woolen, worsted, cottons, unions and mixtures. Recently specialized in men's wear cottons. Seeks position as overseer of finishing or dyeing, assistant superintendent, superintendent or manager.

Age 53, married; references.

A-C-D-1

Education—Chemistry, Temple College, Philadelphia, evenings. Dyeing and textile chemistry, Philadelphia Textile School.

Experience—Employed about 18 years in textile mill, becoming chemist; 5 years as superintendent of finishing on silk and rayon ribbons; 10 years as salesman of chemicals and textile specialties in eastern Pennsylvania and parts of New Jersey; has some knowledge of the processing of all textiles. Seeks position as salesman with well known company.

Age 48; married.

B-10

Education—2 years chemistry, 2 years textile chemistry and dyeing, Lowell Textile Institute, evenings.

Experience—4½ years dyeing and bleaching hosiery, specializing in children's and infants' hose; 3 years assistant dyer, dyeing and bleaching cotton, mercerized and unmercerized, wool, wool-cotton, wool-rayon and wool-silk hose. Seeks position as second hand, assistant dyer or laboratory assistant in hosiery mill.

Age 27; single; references.

B-D-1

Education—High school graduate; textile chemistry, Textile Evening High School, New York City; accounting; typist.

Experience—from 1935 to present employed as colorist with screen printing plant in New York City. Experienced with all types of fibers and all types of dyes. Shade matching. Versed in accounting, typing, modern office procedure and sales promotion. Able assistant to busy executive. Age 46; single; references.

AMERICAN
DYESTUFF
REPORTER

A. P. HOWES
Publisher

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WAR CONTRACTS FOR SMALL MANUFACTURERS

ABOUT 92 per cent of the 185,000 manufacturing plants in the United States have 100 or fewer employes and they normally produce about 31 per cent of the manufactured products. These manufacturers are becoming increasingly important in the war effort but, in many cases, they do not know how to go about getting war contracts. The War Production Board has set up administrative machinery to help such manufacturers and the following steps are recommended in order to make full use of this machinery:

A complete *survey of the manufacturer's facilities* should be made. This survey should begin with the firm's business record and should include a description of normal products made in the plant, the experience of managerial and supervisory personnel, previous war production experience, a financial statement and names of past and present customers for reference.

The manufacturer should take *stock of his labor situation.* In the survey he should list the number of his factory employes, their skills, peak employment of the plant for one, two and three shifts, a description of the available labor supply and the competition for it and a brief analysis of existing and nearby wage rates.

He should take *stock of the plant and its equipment,* describing location, transportation facilities, available power and water facilities and similar production factors.

Complete layout plans, accompanied by photographs, should be made of each section of the plant. A list of all tools should be drawn in which the make, type, age, size, serial number and tolerances usually followed should be included.

It is pointed out that, since the survey is to serve as a guide both to himself and to those from whom the manufacturer must get his contracts, it must be accurate and complete.

Once the survey has been completed the Division of Industry Operations suggests that it will do him most good at the following places:

1. The nearest field office of the Contract Distribution Branch of the War Production Board. (There are 115 offices scattered throughout the country.) At these offices a manufacturer can learn what war items are needed and what he may be able to supply. These offices serve as a clearing house of information for government procurement offices and prime contractors and the manufacturer should keep in close touch with the office serving his district.

2. The Army's District Procurement offices. The addresses of these offices, the type of products they buy and the procedure to be followed in getting orders is contained in a booklet "Army Purchase Information Bulletin" which may be obtained by writing the Office of the Under Secretary of the War Department in Washington.

3. The Navy's Bureau of Supplies and Accounts. Write to the Bureau at the Navy Department in Washington for a booklet "Selling to the Navy" which will give you the necessary information.

4. Local prime contractors. Addresses and other information concerning them can be obtained at Contract Distribution Offices.

It must not be assumed, however, that there is any formula that will bring war work to all manufacturers. Harnessing the capacity of small, medium and even large factories is one of the toughest production problems that America faces. There are many complicating factors and, referring to this, the Division of Industry Operations of the War Production Board states that:

"One is that, because of the extreme urgency of stepping up production immediately, it has been necessary to place contracts with firms which were prepared to fill them—those which were already in war work, but whose capacity wasn't being utilized to the utmost. Another is the limitation in the kinds of work many of the firms without war contracts can do. One of the most important factors is the simple truth that until the attack on Pearl Harbor, America was not spending enough money on the war effort to employ the maximum capacity of all its industries."

Recently, however, Congress has appropriated billions of dollars and more billions will be appropriated. Prime contracts are being placed as rapidly as possible. Firms receiving prime contracts will need thousands of subcontractors to help them meet delivery dates. Many of the large plants which had the bulk of the prime contracts were slow to utilize the facilities of small plants in the past but they will have to sub-contract now. However, to obtain the sub-contracts, the small plants must go after them and show the same resourcefulness which they have showed in the past to obtain regular orders.

TRADE NOTES • NEW PRODUCTS

• CIBA REVIEW

The October, 1941, issue of *Ciba Review* features "The Human Figure in Textile Art." Contents are described by the following titles: The Human Figure in Primeval Art; Human Figures in Symbolic and Ornamental Representation; Hunters and Hunting Scenes on Figured Textiles; Embroidered and Woven Portraits; Herdsmen, Peasants and Laborers on Woven and Embroidered Tapestries of the Gothic Period. There are many interesting illustrations.

• PROCUREMENT POLICIES BROADENED

On the heels of his announcement of a vast production drive to get an immediate increase in America's output of war goods, Chairman Donald M. Nelson of the War Production Board on March 4th signed a directive broadening procurement policies to insure the widest possible placement of war supply contracts and a much greater utilization of small plants and factories.

The directive has these provisions:

1. Effective at once, all military supply contracts are to be placed by negotiation instead of by competitive bidding, unless the Director of Purchases, WPB, specifically authorizes the use of competitive bids.

   This provision is expected to result in speedier procurement and in broader use of the nation's productive capacity. Under competitive bidding, large concerns which already hold extensive war contracts are often able to under-bid small manufacturers who are not doing any war work at all; when this happens, the contract ordinarily is given to the low bidder, even though that may prevent a perfectly capable small firm from getting into war production.

2. In placing contracts, primary emphasis is to be put upon speed of delivery.

   This provision is frankly designed to shift the emphasis away from price and put it upon speed. More favorable prices are often obtained by a sacrifice of speed; by shifting the emphasis, quicker deliveries can be had at comparatively minor increase in cost.

3. Contracts for standard and semi-standard articles relatively simple to make shall be placed with smaller concerns, so that the facilities of the larger, more fully equipped firms may remain available for production of more difficult and complicated items.

   The Services buy some articles which can be made by large numbers of companies, large and small; they buy others which only the biggest manufacturers can handle. If contracts for articles in the first classification are placed with the biggest concerns, the facilities of the smaller firms go unused while the facilities of the big firms are tied up with work that could be produced elsewhere. By ruling that the big firms be saved for the big difficult jobs, the production program gains all around.

4. Subject to these considerations, contracts are to be placed with concerns which need the smallest quantities of new machinery and equipment.

This is designed to get most efficient use of the nation's machine tool capacity and to bring into service as many idle tools as possible.

• MORE RAYON FOR HOSIERY

Larger quantities of rayon will be made available to hosiery and weaving industries under an order (M-37-c) issued on March 4th by the War Production Board.

The order supersedes M-37-a which required rayon producers to set aside the output of 12 per cent of their viscose and cuprammonium spindles and six per cent of their acetate spindles for silk replacement and a hardship pool.

Under the new order rayon producers are required to set aside, beginning April 1, 1942, 17 per cent of their viscose and cuprammonium output. The allocation of acetate remains unchanged at six per cent. These percentages are applied after defense and export requirements have been met.

As a result of the order, the bulk of women's hosiery manufactured after April 1 will be of rayon instead of silk and nylon. Silk has almost passed out of the market and nylon is fast going out, silk being no longer available and nylon being used in the manufacture of parachute cloth.

In January of this year out of 3,072,019 dozen pairs of full-fashioned hosiery manufactured, only 140,577 dozen pairs were of silk, 340,094 dozen pairs of nylon, 904,106 dozen pairs of rayon and the remainder of mixed rayon and nylon. Today's order making available additional quantities of rayon for the hosiery industry will result in an even greater preponderance of rayon hosiery.

The order provides for the replacement by rayon of the silk and nylon formerly used on a pound for pound basis, based on silk and nylon used during the first half of 1941.

Of the viscose set aside, 15 per cent will be reserved for hosiery manufacturers, one per cent for former consumers of yarn-dyed silk, and the remaining one per cent for hardship cases.

Of the acetate set aside, 5½ per cent will be for non-yarn dyed silk and nylon replacement, and the remaining ½ of one per cent for hardship cases.

The order also directs rayon producers to set aside, beginning April 1, four per cent of the viscose and acetate production for export to other American republics. This percentage is to be applied to the entire output, before defense requirements have been met.

• SILK WASTE PRICES

Maximum prices for silk waste at levels prevailing within five days prior to February 28, 1942, are established in Temporary Maximum Price Regulation No. 7, announced on March 3rd by Leon Henderson, Administrator, Office of Price Administration.

The maximums established are applicable to all imported silk waste which arrived in this country prior to February 28, 1942, the effective date of the temporary regulation.

The prices are identical with those set up in Price Schedule No. 14, which was revoked on February 19, 1942.

Silk waste is used to fabricate powder bags for the Army and Navy. Virtually all raw silk itself now in this country has been taken over by the Government for use or is in the hands of manufacturers holding war contracts.

• REPAIR OF TEXTILE MACHINERY

Seeking to speed up war work by the huge textile industry, the War Production Board on March 3rd raised from A-10 to A-8 the preference rating available for deliveries of materials to producers of spare parts for maintenance and repair of textile machinery and equipment.

The A-10 rating for these parts expired March 1, and under an amendment to Preference Rating Order P-53 the plan has been extended until June 30, with substitution of an A-8 classification.

The textile industry, which engaged in a vast amount of Army and Navy work, has been operating on three shifts, with a consequent heavy demand on available machines. It is estimated that the industry's demand for repair parts has doubled in the last 30 months as a result of the expanded production.

The WPB, in order to keep this machinery in top running order, has made it possible for producers to apply a higher

rating to deliveries of materials for production of maintenance and repair parts. Suppliers also will be entitled to apply the A-8 rating to obtain deliveries of necessary parts.

• OPERATING SUPPLIES

Operating Supplies to which a preference rating may be applied under the terms of Preference Rating Order P-89, covering maintenance, repair and operating supplies for the chemical industry, have been redefined by an amendment to the order announced on March 3rd by the Director of Industry Operations.

Ratings under P-89 may be applied only by firms which are given specific authorization with a serial number. Up to the present time no company has received permission to operate under the terms of the order because applications so far received indicate that the order as originally issued was too broad in its coverage.

As defined in the amended order, Operating Supplies means any material which is essential to the operation of the Producer's plant including, but not limited to, libricants, fuels, catalysts, and small perishable tools. Specifically excluded are materials physically or chemically incorporated into the producer's products, and material other than catalysts which enters into the chemical reaction necessary to the manuafcture of the producer's products. Washes, solvents, extractions, etc., are also excluded.

It is expected that serial numbers will soon be issued under the amended order to enable companies engaged in the production of war chemicals to take advantage of its provisions.

The order has also been amended to permit its use by Canadian firms when specifically authorized, in conformity with recently announced policy of the War Production Board.

• ARIDYE PIGMENT DYEING

According to a letter which the Aridye Corp. has recently sent to dyers and printers considerable progress has been made on methods of dyeing textiles with pigments. It is stated that, during the last few months, the Aridye padding method, which employs pigmented emulsions of the water-in-oil type, has been used commercially to dye several million yards of fabric. Referring to this method, the letter claims:

"We believe this method of pigment dyeing will be extensively used when superior light fastness is required on special rayon fabric, and, when lightfastness plus scrubfastness is required, on cotton fabrics such as shirting and work clothes. There is, also, special opportunity for the method in Defense Work right now . . . ."

Bulletins are enclosed which explain the use of the Aridye method in the two following instances for Defense Work:

Sandbag Brown

U. S. Army Engineers are purchasing burlap, having it mildew-proofed and made into sandbags. Osnaburg may be used later. "Aridye Sandbag Brown" was formulated to meet Corps of Engineers Specification No. T-1452, with amendments 3, 4 and 5 (Processing and Coloring Material for Sandbags). It is a solution of asphalt and emulsifying agents in mineral spirits. Its use as a coloring medium, emulsified with copper naphthenate solution, mineral spirits and water has been approved by the Development Section, Chief of Engineers, War Department. This emulsion may be applied on a two-roll padder and dried by any available method, i.e., dry cans, tenter frame or special dryers. Use of this emulsion is covered by U. S. Patent No. 2, 248, 696. Licenses under this patent may be secured only from Aridye Corp. This method of padding is said to have advantages in ease of handling, lower ventilation requirements and low costs.

Camouflage Colors

"Aridye Camouflage Colors" are manufactured specifically for application on osnaburg or burlap as required by Office of Chief of Engineers, U. S. Army Tentative Specification No. T-1212 and T-1213, with subsequent amendments.

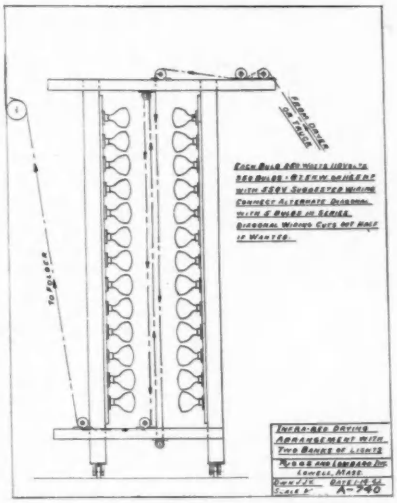
Further information may be obtained from the Aridye Corp., Fairlawn, N. J., Rock Hill, S. C. or Providence, R. I.

• INFRA-RED LAMPS IN CARBONIZING AND DRYING

Riggs & Lombard of Lowell, Mass., have recently designed an infra-red lamp unit for carbonizing vegetable matter in woolen cloth after treating with acid and drying, and also for use as a "booster" in front of an ordinary tenter dryer. It is claimed that initial runs on experimental units installed in various mills have met with great success.

The advantages of this equipment are said to include: a great saving in floor space and better cloth as compared with the conventional baking unit; the rays penetrate and dry evenly from within, therefore, they leave the surface fibers in better condition and eliminate any tendency of the cloth to "yellow; this method also permits a tremendous increase in production, so that, although the operating cost is considerably more than that of conventional baking, the cost per yard of cloth is reduced up to 32 per cent.

One requirement for the most successful operation of this equipment is to slightly over-dry the cloth in the tenter dryer, that is, to "start" the burrs at that point. The average infra-red unit consists of two sets of 175 lamps of the R-40, 250 watt type



Infra-Red Drying Arrangement

mounted on two vertical boards 7 feet square, the lights being spaced on 6" centers and staggered to give a 3" pattern. These lamps develop a temperature in the cloth of about 500 degrees. The distance between lamps on opposing boards varies from 10" to 18". The number of times that the cloth passes through the unit varies with the weight, but the average is about three times. The unit is 2' long, 8' wide and 8' high. Cloth travels from 17½ to 28 y.p.m., depending on the weight, and total time of exposure averages about 25 seconds for a 12 oz. woolen 28 y.p.m. The usual location is between the tenter dryer and the folder. Cloth up to 78" wide can be handled by this unit. Kilowatts consumed by this unit are 87½. Initial cost is about $1,500.

If only 60" cloth is run, the infra-red unit requires only 98 lamps, and in this case its K W consumption is only 68½.

When infra-red lamps are used for drying only, the usual practice is to set 60 lamps across the entrance rails to the tenter dryer and use them to boost the production of the latter. In this day capacity of the dryer is said to be increased about 20 per cent. The cost of the lamps is relatively small and the cloth is said to show no change in color or condition.

It is claimed that these lights are also ideal for any process requiring high temperature, such as waterproofing of cloth or wrinkle-proofing.

• GENERAL RELEASE

General Dyestuff Corp., 435 Hudson Street, New York City, has recently released a circular describing the following product:

Alizarine Sky Blue B—a bright acid blue said to be of very good fastness to light. It levels well from an acetic acid dyebath and produces dyeings said to be of

good all around fastness properties. It is used for all wool dyeing purposes: loose wool, slubbing, piece goods and yarns. It can be dyed also according to the afterchrome, monochrome or chrome mordant methods, producing slightly duller shades of slightly improved wet fastness, e.g., washing, fulling and perspiration. It is well suited for brightening chrome color combinations. It is stated that, since Alizarine Sky Blue B possesses good affinity from a neutral bath, it is of value for neutral dyeing. Its fastness to light when dyed neutral, however, is a little inferior. Circular G-308.

• ASST. G. M., R. & H. CHEMICALS

Frank S. MacGregor, Director of the Priorities Division of E. I. du Pont de Nemours & Company since June, 1941, has replaced Milton Kutz as Assistant General Manager of the R. & H. Chemicals Department.

Mr. Kutz, who has been Assistant General Manager since 1933, has been away for several months due to ill health and upon his return will assume his new duties as Sales Advisor and Assistant to the General Manager of the R. & H. Chemicals Department.

A native of Lawrence, Massachusetts, Mr. MacGregor was graduated from Massachusetts Institute of Technology in 1907. He worked as a metallurgist and consulting engineer before joining the Du Pont Company in 1916.

During his 26 years with Du Pont he also has served as Assistant Director of the Development Department, Control Manager of the Paint Department, General Manager of the Acele Department of the former Du Pont Ryon Company and President and General Manager of Ducilo S. A. Productora de Rayon in Buenos Aires.

Mr. Katz, a native of Indiana, joined The Roessler and Hasslacher Chemical Company in 1897 as an office boy rising to Vice-President and a Director.

When that company was merged with Du Pont in 1930, he was made Director of Sales. He was named Assistant General Manager when the R. & H. Chemicals Department was established in 1933.

• SHIPPING CYLINDERS

Unless chlorine and ammonia cylinders are kept in constant circulation, many users of these two vital chemicals may have difficulty in obtaining adequate supplies, according to R. J. Quinn, of the Mathieson Alkali Works, Inc., producers of these two chemicals.

In spite of having to make heavier shipments than ever before, producers can get no new cylinders, so that the existing supply must serve all users, Mr. Quinn explains. However, if cylinders are kept circulating, it is probable that the demands of all essential industries can be met.

When cylinders are idle, it is usually due to carelessness, which can be easily corrected, if those in charge realize the need for prompt action, Mr. Quinn points out. All those having reserve stocks of either ammonia or chlorine should do everything within their power to get the cylinders back into service as quickly as possible.

•CLASSIFIED• ADVERTISEMENTS

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $6.25 per column inch or less per insertion.

POSITION WANTED: Hosiery dyer for past sixteen years on pure silk, cotton, rayon, nylon and mixed fibers, with large hosiery mill in south as head dyer. Capable of handling large production, willing to go anywhere, best reference. Member of American Association of Textile Chemists and Colorists. Write Box No. 355, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: PLANT MANAGER: Experienced plant and production manager in the dyeing, printing and finishing field seeks new connection with progressive organization as plant manager or superintendent of production. Will consider position as contact man between the New York market and the mill on production troubles and adjustments. At present employed. Write Box No. 363, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: Dyer wants position in New York City or vicinity. Presently employed as head dyer in large textile mill, has broad experience in dyeing of cotton, silk, rayon, Celanese and nylon, both yarn and piece goods. Capable of handling large production. College graduate with theoretical knowledge. Age 35. Write Box No. 365, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

WANTED: Textile Chemist with practical experience in the dyeing of mixed fiber yarns and piece goods. Knowledge of wool processing essential as demonstration work will be involved. State experience and educational background. Write Box No. 370, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

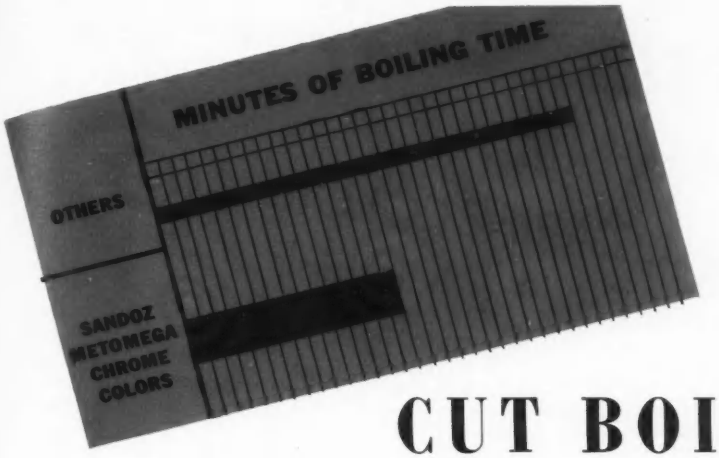
POSITION WANTED: Research chemist, textile dyeing and finishing, experienced in compounding specialties in the textile and allied trades, seeks connection with progressive organization. Write Box No. 371, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

WANTED: Dyer with experience on cotton piece goods for sales and demonstration work. Give experience, draft status. Our personnel has been notified. Write Box No. 372, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

WANTED: Technical graduate with several years experience in finishing plants wanted for sales service and correspondence. Write Box No. 373, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: Fireproofing of canvas is the particular field of interest of research chemist, desiring southern location. College education, knowledge of formulation, raw materials, test methods. Has also had training and experience in synthetic resins. Write Box No. 374, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

WANTED: Dyer (skein). Practical dyer wanted for tie silk plant in Pennsylvania, to take complete charge on Smith Drum equipment, for silk, rayon, acetates, wool, and combination yarns; commercial fast and indanthrene dyes. Give education and complete history. Enclose photograph (not returnable). State salary desired. Write Box No. 375, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.



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Metachrome dyeing with Metomega Chrome colors reduces boiling time by as much as 50% — speeds up production. What's more, it is easier to apply . . . speeds up the development of correct shading. It is possible to check the formula after only 15 minutes of boiling time.

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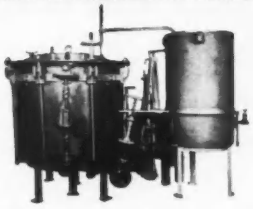
Photograph shows a stainless steel Franklin Package Dyeing Machine, which is a type of machine which can be used for the dyeing of worsted yarn in the package form.



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to
ALL EMPLOYERS

★ From the United States Treasury Department ★

WINNING THIS WAR is going to take the mightiest effort America has ever made—in men, in materials, and in money! Every dollar, every dime that is not urgently needed for the civilian necessities of food, clothing, and shelter, must, if we are to secure final Victory, be put into the war effort.

An important part of the billions required to produce the planes, tanks, ships, and guns our Army and Navy need must come from the sale of Defense Bonds. Only by regular, week by week, pay-day by pay-day investment of the American people can this be done.

This is the American way to win. This is the way to preserve our democratic way of life.

Facing these facts, your Government needs, urgently, your cooperation with your employees in *immediately* enrolling them in a

PAY-ROLL SAVINGS PLAN

The Pay-Roll Savings Plan is simple and efficient. It provides, simply, for regular purchases by your employees of United States Defense Bonds through systematic—yet voluntary—pay-roll allotments. All you do is hold the total funds collected from these pay-roll allotments in a separate account and deliver a Defense Bond to the employee each time his allotments accumulate to an amount sufficient to purchase a Bond.

The Pay-Roll Savings Plan has the approval of the American Federation of Labor, the Congress for Industrial Organization, and the Railroad Brotherhoods. It is now in effect in several thousand companies varying in number of employees from 3 to over 10,000.

In sending the coupon below, you are under no obligation, other than your own interest in the future of your country, to install the Plan after you have given it your consideration. You will receive—1, a booklet describing how the Plan works; 2, samples of free literature furnished to companies installing the Plan; 3, a sample employee Pay-Roll Savings authorization card; and 4, the name of your State Defense Bond administrator who can supply experienced aid in setting up the Plan.

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4. It reduces the percentage of Defense financing that must be placed with banks, thus putting our emergency financing on a sounder basis.
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GPO 16—35943-1 Form No. DSS-BP-2

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It is slightly bluer and brighter than the Bordeaux 2BL types. It possesses distinctly superior washfastness, penetrates better, and is equal to the Bordeaux 2BL types in lightfastness and dischargeability.

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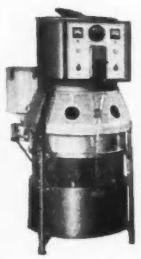

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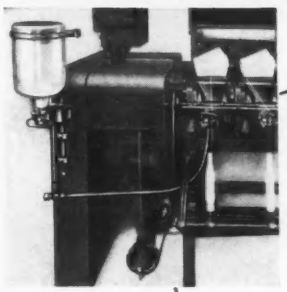

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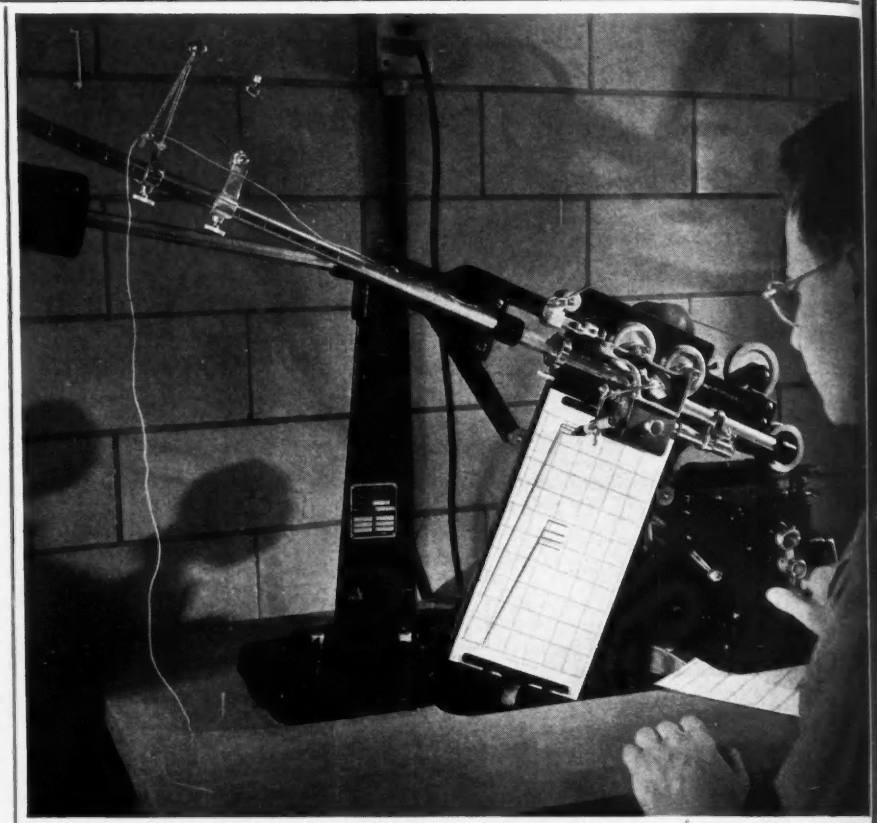

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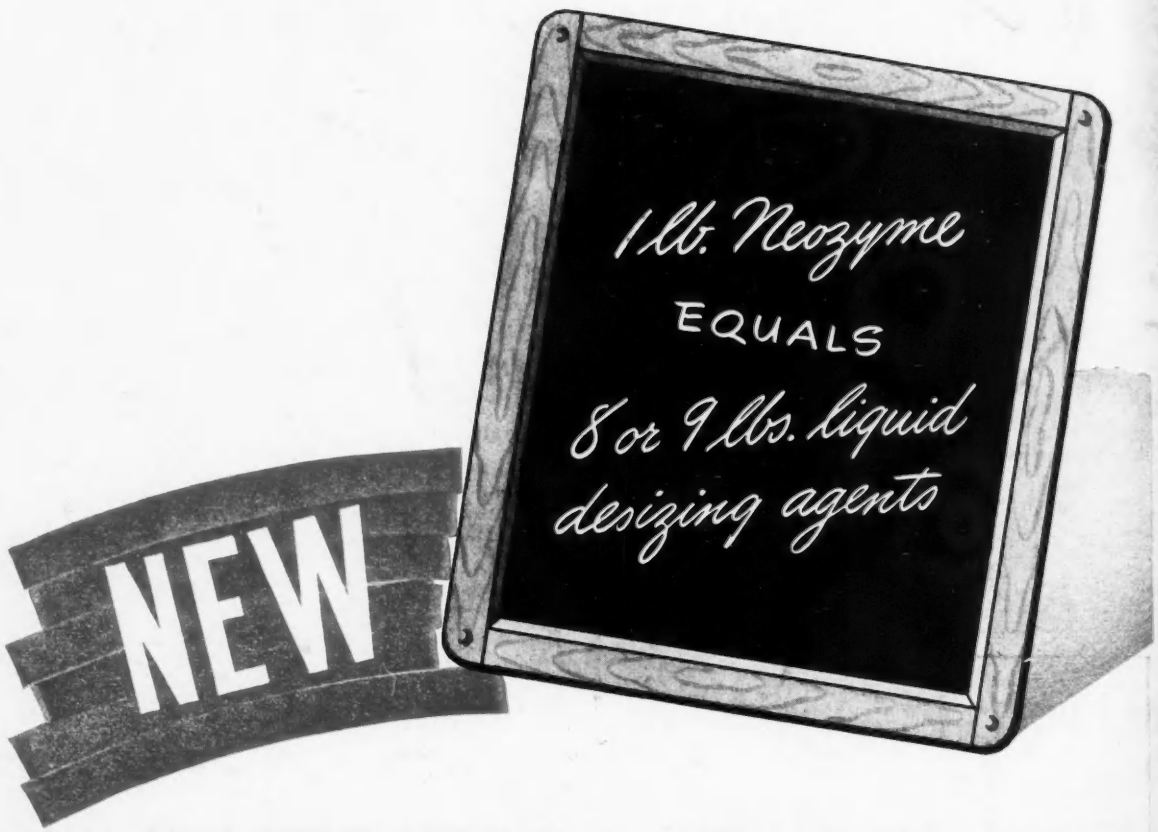

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